

ACCULTURATION AND THE HEALTH BEHAVIOR OF VIETNAMESE, SOMALIS,
ESTONIANS AND RUSSIANS LIVING IN FINLAND IN 2002

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Introduction: Finland like many other countries is no longer a homogeneous country. The proportion of immigrants residing in Finland has increased more than five folds in the last two decades. Immigrants' health therefore, will continue to be a matter of interest to investigate. There is enough evidence suggesting that acculturation influence the health and health behavior of migrant origin groups. Cultural and ethnicity are pre-existing determinants of life style choices and it is generally accepted that, health behaviors is influence by one's cultural background.

Objectives: The current study disentangles the association between acculturation and the health behavior and body mass index of the selected migrants.

Study subjects and methods: A cross-sectional study about living conditions and health of the selected migrant population in Finland was done by Statistics of Finland in 2002. A random sample of 20-65 years old Russians, Estonians, Somalis and Vietnamese in Helsinki, Vantaa and Espoo was selected to the study. Additional sample of Russians were selected from the cities of Turku and Tampere. The total sample size was 2208 of which 62% (n=1361) participated with varying response rates (60% of Russians, 63% of Estonians, 68% of Somalis and 56% of Vietnamese). Postal questionnaire was sent to Russians and Estonians and structured interviews were done for Vietnamese and Somalis. In this sub-study, cross tabulation was used to analyses the association between acculturation and the health behavior of the migrants. Pearson's chi-square test was used to measure the statistical power of the associations and significance was determined at the 0.05 level.

Results: The findings revealed ethnic differences in the health behavior of the migrants. Daily smoking was very high among Vietnamese men especially among less acculturated. There is some evidence that daily smoking and alcohol use increases among Somalis (both genders) and Vietnamese women who are more acculturated. Alcohol use was highest among Russians and Estonians. However the acculturation effect on the use of alcohol among Russians and Estonians did not point to any direction.

Conclusions: Acculturation has an effect on migrants' health behavior in many ways. Being a Vietnamese, Somali, Estonian or Russian to some extend could determine the acculturation effect on the health behavior of the migrants. The association between acculturation and health behavior is gender specific for some ethnic minorities. Somalis do have good health behavior, and Vietnamese women too, but Russians and Estonians whose cultural background and health habits resemble those of Finns had the worst health behavior.

Key words: Acculturation, health behavior, migrant, smoking, alcohol use, physical activity and body mass index.

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1.0 INTRODUCTION

The world is rapidly shrinking. Nations have become interdependent on each other making migration more and more a global phenomenon and diverse (Castles and Miller, 2003). People travel across borders for many reasons including: voluntary and force migration. As this phenomenon continues, immigrants' health has long been and would continue to be a matter of interest to explore.

There is an increasing realization of disparities in the health among and within ethnic groups in western societies (Hunt et al., 2004). There are many complex reasons behind the observed health inequalities among ethnic minorities. Conditions in host environment may be completely different from what migrants are used to in their country of origin. And the process of migration and adaptation can also lead to radical changes in the socio-economic status of migrants. Depending on both the pre- and post-migration living conditions, these changes in education, employment and income can affect the general health and health behavior of first generation-migrants positively or negatively (Massetter and Callister, 2009).

Also, culture and ethnicity have been noted to be pre-existing determinants of life style choices (Gedrich 2003, Kreuter et al., 2004). Culture as an antecedent, can affect health directly or indirectly, and has generated concerns among health care providers, researchers and policy makers (Hunt et al., 2004 and). Ethnicity has also proven to be determinant factor for certain diseases and lifestyle choices. Differences in health status have been documented among ethnic minority groups in different countries: in UK (Chandola, 2001); in Netherlands (Ujcic-Voortman et al., 2009); and in USA (LaRosa and Brown, 2005).

Furthermore, acculturation which is consistently refer to "social change" or "changes in the original cultural patterns" of acculturating individuals (Escobar et al., 2000, Berry, 2003, Trimble, 2003), has an effect on migrants' health in many ways (Salanta and Lauderdale, 2003). However the reasons for migration and the cultural distance between country of

origin and the host country can determine how acculturation and associated health outcomes occurs (Salanta and Lauderdale, 2003). Some researchers contend that migrants are in good health when entering a new host country due to healthy migrant effect. Meaning that, the healthiest are able to live thorough migration process. On the other hand they have good health due to the routine healthy lifestyle behaviors which they are accustomed to in their country of origin. For example: doing physically demanding work, walking for transportation, and eating food high in fiber and low in fat (Perez 2002, Berrigan et al., 2006, and Barnes and Almas, 2005). However the condition erodes as migrants become more acculturated (Caperchione et al., 2009).

Other scholars also argue that migrants particularly those who enter as humanitarian refugees are likely to suffer from poor health as a result of the deprived conditions in country of origin and/or in refugee camps. When such migrants get acculturated, they may westernize their health behavior positively by adopting to low fat food, increase physical exercise, smoke and drink less and learn western health literacy about what is healthy, how to prevent illnesses, and how to use the health care services (Rogerson and Emes et al., 2006, Richardson et al., 2002, and Choudhry, 2001).

Clearly, ethnicity, culture, the process of migration, acculturation, and adaptation has some effect on the health behavior of migrants. Finland like many other countries is no longer a homogeneous country. The trend is changing swiftly. The number of foreigners living in Finland has increased more than five folds since 1990 (Statistics Finland, 2009). There is very little information on migrant's health and health behavior in Finland. A survey conducted by Statistics Finland revealed huge disparities within and among the health behavior of Vietnamese, Somalis, Estonians and Russians living in Finland in 2002 (Pohjanpää et al., 2003). However, the study did not consider the effects of acculturation, on observed disparities in the health behaviors. The focus of the current study therefore is to disentangle the association between acculturation and the health behavior and body mass index (BMI) of the migrants using the data on the living conditions of Vietnamese, Somalis, Estonians and Russians living in Finland in 2002 by statistics Finland.

1.1 Concept Clarification

Acculturation: is a process in which members of one cultural group adopt cultural traits or social patterns, the beliefs and behaviors of another group. Although acculturation is usually in the direction of a minority group adopting habits and language patterns of the dominant group, acculturation can be reciprocal--that is, the dominant group also adopts patterns typical of the minority group. Assimilation of one cultural group into another may be evidenced by changes in language preference, adoption of common attitudes and values, membership in common social groups and institutions, and loss of separate political or ethnic identification (Hispanic Center of Excellence, 2011).

Measuring acculturation: Proxy measures of unidimensional acculturation such length of residence, language proficiency are widely used as indicators of acculturation in health studies. These measures are quick and convenient, and are often comparable with measurement scales (Hunt et al., 2004). However, it must be acknowledged that proxies do not directly measure elements of acculturative change such as attitudes or behaviors, which can limit the usefulness of the results. For convenient reasons length of stay in Finland was used as measures of acculturation which is thoroughly explained in 4.5.

Health behavior: “an action taken by a person to maintain, attain, or regain good health and to prevent illness. Health behavior reflects a person's health beliefs. (Mosby's Medical Dictionary, 2009). The health manifestations as a result of health behavior do not grow out of a vacuum, but they are deeply connected to the social and cultural environment, just as inequalities in health and their confounding factors are more general. Smoking, alcohol use, and physical activity are use as measures of health behavior because there is a school of knowledge that these three habits are major risk or protective factors to important public health problems in Finland (Palosuo et al., 2009). There was no data on dietary habits which is another important factor for public health problems; therefore obesity was included in the analysis. Health behavior variables are carefully described in 4.5

2.0 LITERATURE REVIEW: MIGRANTS' HEALTH BEHAVIOR AND OBESITY

The notion that disparities in health can be determined by how migrants are accustomed to the host culture is a result of health behavior or lifestyle choices which are influenced by the customs, attitudes, beliefs and norms. Cultural values and beliefs can partly cause people to make choices concerning their health habits which partially reflect the observed disparities in health (Hunt et al., 2004).

The work of Masseter and Callister (2009) is evidence that migrants' general health and health behavior deteriorates as they stay longer in western countries. Other theorists also argue that some ethnic minorities westernize their health behavior positively (Rogerson and Emes et al., 2006, Richardson et al., 2002, Choudhry, 2001). The current review throws more light on the smoking and drinking habits of immigrants and their participation in physical activities in western societies. It also reveals the knowledge gaps.

2.1 Smoking and alcohol consumption habits of migrants

One of the biggest public health concerns of our time is smoking, which has led to the implementation and advocacy for health promotion policies and campaigns. Sorting out the risk groups has become apparent for effective intervention, although it is a risk factor which is adjustable (Van Oort et al., 2006).

There has been several ways of identifying these risk groups in different studies. For example, in western societies the prevalence of smoking has been found to be higher among men (Giskes et al., 2005); those with few years of education (Huisman et al. 2005 and Tucker et al. 2003); the unemployed (Reine et al., 2004); and those who are distress (Tucker et al., 2003).

There has been some studies conducted among immigrants and ethnic minority groups with regards to smoking, although the frequency of smoking has been found to be higher in several migrant populations (Lindstrom and Sundquist, 2002). A large amount of studies

concerning smoking and drinking habits of migrants were carried out in the UK and USA. The results of the determinants of smoking of such studies were rather mixed with regards to the association between smoking and socio-economic status. The determinants of smoking may differ among minority groups (Van Oort FVA et al., 2006).

In their investigations on the living conditions of Russians, Estonians, Somalis and Vietnamese living in Finland 2002, Pohjanpää et al. (2003) noticed in that Somalis barely smoke in comparison to their counterparts. Some acculturation theories on the hand, predict that as migrants continuously have an encounter with the host population, they will eventually adopt the behaviors of the host population they come into contact with. There is the need therefore to find out whether length of stay in western societies leads to a change in health behavior. In addition, the association between acculturation and smoking may vary by educational background of migrants.

Some studies have concluded that the more acculturated migrants are more likely to use alcohol than their less acculturated counterparts (Wahl and Eitle, 2010). Alcohol abuse and dependence have also been recorded to have a positive association with acculturation. Different measures of acculturation have been employed by various investigators. For those researchers who have measured acculturation on the basis of language proficiency, noted that migrant with grater linguistic skills are at a higher risk of using alcohol and other illegal substances than those with poor linguistics skills (Wahl and Eitle, 2010).

Similarly, the few studies that have focused on using “generational status” as a measure of acculturation have concluded with comparable results to the research on linguistic assimilation. The prevalence of alcohol use constantly increases across Latino migrant generations. Specifically, the use of alcohol among Latino second-generation migrants is higher than among their first-generation counterparts (Hussey et al., 2007). Some acculturation theories envisage the process of adaptation as linear; as migrants gradually get use to the values, beliefs, and norms of their new society, they in turn become integrated socially and economically and also adapt to the mobility of the host country.

Which means migrants from non-western societies where alcohol use is not socially accepted can eventually begin to use alcohol when moved to western societies. The longer the contact of a group with the host culture, the more likely they adopt to the health behavior of the host culture (Wahl and Eitle, 2010).

Some scholars widely accept that some traditions and religions discourage and sanctions drinking among women but not men, while others do not tolerate the use of Alcohol at all. Many studies have consistently reported significant gender differences in alcohol use among ethnic minorities in the West (Wahl and Eitle, 2010, Pohjanpää et al., 2003). The work of Pohjanpää et al. (2003) indicates that Somali and Vietnamese women are more likely to abstain while Russian, Estonian, and Vietnamese men drink more frequently and drink more heavily. The gender differences that exist in the use of alcohol have been evident in some studies across multiple migrant subgroups (Wahl and Eitle 2010, Pohjanpää et al., 2003, Nielsen and Ford, 2001).

Owing to these differences that have been observed, some studies have reservations about the effects of acculturation by gender. Other studies have found that regardless of gender, the use alcohol among adults' increases with acculturation, while Zemore (2005) concludes that this association holds for women but not men. According the work of (Wahl and Eitle, 2010), there is no significant difference in the drinking patterns of the most acculturated and lest acculturated migrants Hispanic men. Contrarily, the most acculturated Hispanic woman were found to have a similar drinking habit as non-Hispanic women while the least acculturated Hispanic women were more likely to abstain. Wahl and Eitle (2010) therefore infer that the host culture which is more liberal and less prohibitive about women drinking has a positive association with the increase use of alcohol among the most acculturated Hispanic women. The trends with regards to acculturation's effects on drinking imply that the drinking habits of ethnic minorities would eventually converge with the patterns of alcohol use of the host culture.

2.2 Migrants' participation in physical activities

Immigrants in Netherlands have been recorded to participate less frequently in sporting activities than natives (Cornelisse-Vermaatand van den Brink, 2007). The reasons behind this phenomenon are numerous and are subjective to individuals and different groups of migrants. Many of these factors can be clustered into two main themes: cultural, and health beliefs and social and environmental changes (Caperchione et al., 2009).

Different cultures and migrant groups possess some cultural and religious values which can impinge upon their interest to engage in physical activities (Rogerson and Emes, 2006). It has been recorded that migrants from Arabic countries who are Muslims are less likely to participate in physical activities. The five prayers in a day can be a source of obstacle to organizing regular physical activities, as all activities must stop during the times for prayers. To engage in sporting activities, an individual requires energy from nourished food and fluids. The long fasting observed by Muslims during the month of Ramadan can also become a hindrance in terms of maintaining correct energy balance for physical activities (Guerin et al., 2003, Rogerson and Emes, 2006).

Physical activity is not usually encouraged among migrant women from many non-Western societies as women are expected to be at home nurturing family members (Lawton et al., 2006). The interpretation of the holy scripture by some religions also prohibits women to engage in physical activity, and for some who allow, only do so on the condition that: the women dresses "appropriately"; that they do not have physical contact with men, and that their activities do not interfere with the house hood chores (Lawton et al., 2006, Guerin et al., 2007; and Guerin et al., 2003). Religious fatalism has also been recorded to be barrier to physical activity for some migrant groups. The doctrine of fatalism creates the perception that health, illness and diseases are pre-ordained by God and that one cannot help to reduce the risk of disease or death through physical activities. Migrants with such notion therefore entrust their health into the hands of their object of

worship and therefore do not find the need to partake in physical activities (Lawton et al., 2006, Walseth and Fasting, 2003).

There is an evidence to suggest that with a strong and reliable social network, many migrants could participate in regular physical activities (Wolin et al., 2006). In their report, Belza et al. (2004) also recorded social isolation as a common theme reported by immigrants from multiple backgrounds as a barrier to physical activity. This is in harmony with Amesty (2003) who noticed social isolation, separation from relatives and friends, and being a newcomer in a host country as barriers to regular physical activities among Hispanic migrants living in the USA.

Most non-western immigrants originate from countries with warm weather to host countries with varied weather and climate conditions, which can be a barrier to sporting activities (Rogerson and Emes, 2006). For example Belza et al. (2004) found that migrants from Vietnam living in the Seattle area in USA participated less in physical activities due to the unfriendly climate conditions which they perceive as making it difficult to breathe. Similarly, Kalavar et al. (2004) observed in their studies that, Asian Indians living in New Jersey viewed snow as a barrier to physical activity because of a fear of falling and subsequent injury. The weather conditions in a Scandinavian country like Finland can be very hostile, and therefore as a barrier to health promoting physical activities, especially for migrants from countries with warm climate. Change of environment as a result of migration poses a challenge of language barrier. Some immigrants to the western societies come from developing countries where illiteracy rate is considerably high. Some migrants therefore migrate without being able to read and write their own language, let alone to learn the host country's dialect. The problem to navigate facilities for physical activities is exacerbated with the language barrier (Belza et al., 2004). The work of Guerin et al. (2003 and 2007) conducted in New Zealand, revealed that understanding instructions was a problem for Somali women who participated in physical activity programs, in spite of the availability of interpreters.

2.3 Obesity and migrant's eating habits

Overweight has long been established to be a risk factor for several diseases and it has been recognized that after staying for some years, migrants tend to gain weight in the United States. On average, migrants initially have 2% and 5% BMI lower than the U.S.-born women and men respectively. But after staying for about 10 years the female migrants have BMIs comparable to the US born. The BMIs of the male migrants also converge with the US-born after 15 years of migration to the United States of America (Antecol and Bedard, 2006). There is consistency in such results from other studies. In their study to find out the prevalence of obesity among US migrant groups by duration of stay, Goel et al. (2004) observed that 8% of migrants who had resided in the United States less than 1 year were obese, compared to 19% of the migrants who had lived in the United States for 15 years or longer.

The inevitable rise in the prevalence of obesity and diabetes, which are related to dietary habits, has created a great concern among health authorities in the west (Must et al., 1999; Morgan et al., 2000). There are substantial racial differences in the prevalence of overweight among immigrants to the USA and locals (Haas et al 2003 and Comelisse-Vermaat and van den Brinkt, 2007). Higher than average levels of obesity have been recorded in Somali communities in New Zealand and Australia (Burns, 2004, Guerin et al., 2007) and in London, UK (Straus et al., 2007).

Insufficient physical activity is well documented to have direct and strong association to higher prevalence of obesity and overweight. In their observation, Aranceta et al. (2001) noted that the ethnic differences in the prevalence rate of obesity were due to the socio-demographic factors in food and other lifestyles patterns. They supported their argument with other regional dietary surveys carried out in Spain which noted that women with lower economic status consume more fat and eat less fruits and vegetables. They therefore suggested that health interventions to combat the prevalence of obesity and overweight to take into account the socio-demographic factors (Aranceta et al., 2001).

One of the major concerns with the fight against obesity in western societies has been lifestyle and eating habits. People having higher intake of fat or higher fat: sugar ratio were noted to be more likely to be obese (Aranceta et al., 2001) and some minority groups for example Somalis have been noted to eat more meat (containing saturated fat) and add more sugar to their tea (McEwen et al., 2009). The next section of this review discusses the dynamics between migrants' dietary habit and obesity.

There is a gap in our understanding about dietary beliefs and eating habits of minority population. As some investigations have condemned the traditional eating habits of certain minority groups, for example Somali community in UK, because they were causing overweight, deficiencies in calcium and vitamin D (Maxwell et al., 2006). Another study, encouraged the traditional eating habits of Somali refugees in Canada as they have positive association with cancer prevention (Paisley et al., 2002). This part of the study reports the findings from other studies that sought to fill in the gaps in our understanding of the dietary beliefs and eating habits of migrants.

Latino migrants in the USA are reported to consume unhealthy diet compared to other ethnic groups. According to Ayala et al. (2008), most researchers have concluded that food intake is arguably one of the major determinants of obesity and other related chronic diseases among Latino population in the USA. They attributed the consumption of less healthy diet among Latino groups to lower socio-economic status, less access to healthful foods, and food insecurity. Also Ayala et al. (2008) linked the unhealthy eating habits of Latinos to migration and acculturation process. The impact of migration become more evident when years lived in the USA, country of origin and age on arrival to the USA are used as measures of acculturation (Ayala et al. 2008).

In one focus group study, Sealy (2010) of minority parents regarding the decision they make in selection of food for themselves and their families indicated cultural identification to be one of the major themes that influence food selection. In addressing obesity and other health problems, parental attitudes about eating habits, food preparation, and dietary guidelines are crucial (Sealy, 2010).

People from different cultural backgrounds usually have different food patterns and each ethnic group has a typical cuisine and eating habit. On migration these patterns in food and eating habits can be altered. Finnish twin migrants in Sweden recorded a reduction in the consumption of typical Finnish foods and an increased consumption of fresh fruit compared with co-twins living in Finland. The twin in Sweden consumed more rice and pasta but less potato and sweet pastries. Living in a different country for increased years, is clearly associated with major changes in health behavior including dietary beliefs (Hammar et al., 2009).

2.4 Gender differences in health behavior

Migrant women in industrialized countries have been noticed to develop negative health behaviors such as smoking and alcohol use as they become more and more accustomed to receiving countries than their fellow men. There are many reasons behind this phenomenon. “Westernization” which is characterized by industrialization, modernization, and urbanization are somehow associated with unhealthy health behaviors (Bethel and Schenker, 2005).

In order to alter the risk behavior of migrants, it is essential to monitor the effect of acculturation, especially with women (Bethel and Schenker, 2005). Increased alcohol use and smoking were associated with acculturation among Hispanic immigrant women (Bethel and Schenker, 2005). Similarly, a chunk of less accustomed migrant women in the USA, were observed to desist from the use of alcohol than their counterparts who were more highly acculturated (National Center for Health Statistics, 2005).

Being more acculturated is not the only factor associated with smoking among migrants. In one systematic review (Zhang and Wang 2008), acculturation was found to be a risk factor for smoking among women, whereas less acculturation was associated with high

smoking among men. Few years of education, widowed, divorced, and separations were contributing factors to smoking among the migrants (Zhang and Wang 2008).

The association between smoking and acculturation has been argued to be gender specific (Zhang and Wang, 2008, Bethel and Schenker, 2005, Kim et al., 2007). The gender differences in the association between smoking and acculturation, has been attributed to the behavior, perception, attitudes and values towards smoking which differ between sexes in migrants countries of origins (Zhang and Wang, 2008). In some countries smoking is socially acceptable and even necessary for men, while it is socially unacceptable for women to smoke (Fu et al., 2003). On the other hand, smoking in western societies is becoming more and more unacceptable, though it is liberal for both sexes. As a result, some migrant men may adapt to the societal norms in the west with regards to smoking and stop smoking. The opposite may be the case for some women from countries where female smoking is not liberal. As they get to western societies where smoking is not gender restricted, women increasingly start smoking (Zhang and Wang, 2008).

The effects of acculturation and smoking habits and the direction of this relationship vary among studies. A positive association was found between acculturation and smoking among women in nine out of the eleven studies and a negative association was found in one of those studies in on literature review (Ning et al., 2008). Although different acculturation methods were employed most of the studies found a negative association between acculturation and men though, they did not yield a strong statistical power (Ning et al., 2008).

In general, among all the Asian ethnic subgroups (Chinese, Japanese, Korean, Vietnamese, Filipino and South Asian Americans) studied, second generation male or above had lower rates of smoking just as those who had stayed for longer period in The United States. Contrary to this observation, more acculturated women from the same ethnic minority groups speaking English at home or being second generation or above or having stayed in

the USA for 15 years or more, smoked more than those who were not acculturated. They concluded that men who were acculturated by speaking only English language at home were less engaged in smoking and were more likely to quit. The outcome from the women group revealed an opposite scenario where women who were more accustomed were found to have higher prevalence of smoking (Ning et al., 2008).

2.5 Impact of social-economic variables on migrants' health behavior

He it is discussed whether the socio-economic status of migrants in general improves or deteriorates after migration and how these variables affect migrants' lifestyle choices. Educational attainment, employment and income are used as measures of socio-economic status. In the UK lower educational background, the nature of work, and income levels have continuously been an issue of concern regarding poor health behavior among ethnic minorities (Department of Health, 2002).

In Finland unemployment rates was higher among Somalis and Russians, and of those who were working, their average monthly income was lower than in the Finnish population (Pohjanpää et al., 2003). Eating healthy food and participating in physical activities can be expensive for these migrants who are unemployed and those receiving small salaries. Socio-economic variables have been argued to have more impact on the health behavior of immigrants than cultural acculturation and individual-level factors. It may be therefore more expedient to consider socio-economic factors than acculturation when investigating into the health behavior of migrants. Especially for older migrants who have developed and inculcated certain health habits into their daily lives, acculturation may not have much influence on their health behavior as socio-economic factors might (Parikh et al., 2009).

Health and general wellbeing of an individual is influenced by education. It provides the individual with an understanding of the etiology of diseases and helps provide a sense of control and mastery over life circumstances. It boosts the chances of securing a good job and potentially increasing the income level. Having good education hypothetically makes people live a healthy life style because literacy enhances people's ability to access and comprehend health information. There is a strong association between educational background and disparities in health behavior. Individuals with higher educational backgrounds make healthy lifestyle choices and have higher life expectancy than those with lower or no educational attainment (Department of Health, 2002).

Asian migrants groups in the USA smoke more with lower educational background. On the other hand, people who possess a higher education were more likely to quit smoking among both sexes from the same minority groups (Ning et al., 2008). In developed countries, obesity is more common among people who are less educated while the situation is completely the opposite in low resource countries. In developing countries obesity is rather high among more affluent people imitating the western life style (Aranceta et al., 2001). Clarifying how migrants in Finland westernize their health has become apparent for this study.

Changes in employment status can affect health positively or negatively. If migration results to a better employment, it enriches the socio economic status which will eventually improve the lifestyle and general health (Masseter and Callister, 2009). Minorities from low resource countries especially Sub-Saharan Africa, adapting to the western “comfortable life” can result in unhealthy lifestyle. Obesity is still not seen as a disease in developing countries such as those in sub-Saharan Africa. Indeed, obesity and overweight is still considered among some African population as an evidence of success, wealth, good health and happiness (Wallace, 2006).

2.6 Health behavior in the context of Vietnamese, Somalis, Estonians and Russians

Majority of Vietnamese and Somalis immigrated to Finland as refugees or asylum seekers (Kosonen, 2008). Refugees are persons living outside their country with a well-founded fear of persecution in that country because of race, religion, nationality, membership of a particular social group or political opinion (United Nations High Commissioner of Refugees, 2010). The Vietnamese and Somalis who migrated to Finland comprised of people of immensely different educational and cultural backgrounds. The first set, of Vietnamese moved to Finland shortly after the Vietnam War. Among them were mostly well-educated people who had lived in urban areas. On the other hand, there were also some Vietnamese and Somali immigrants, who arrived during the 1980s and early 1990s respectively. Some of these immigrants had been on the lower socio-economic rank living at a subsistence level. Most of these immigrants were uneducated and could not read nor write their native language as well as Finnish language (Kosonen, 2008). Lower education level among Somalis and Vietnamese has been documented in Finland. 24% of Somalis and 19% of Vietnamese had no education at all (Pohjanpää et al 2003, 85-86).

Above and beyond, many of such migrants sometimes had lived in an unstable conditions including: captivity, severe physical and psychological trauma, starvation, political unrest, and long stays in refugee camps. As a result of these experiences, these populations are prone to psychosocial problem such as depression and posttraumatic stress disorder, which can be reason for alcohol abuse among such population (Amodeo et al., 1997). It should be noted that the background of these involuntary migrants with possibly traumatic loss of family, friends and country can have its own specific impact on acculturation and its outcomes.

Vietnamese

Just some few studies have indicated that populations with such a background are at high risk for heavy alcohol consumption. For example, a study of Vietnamese living in California reveal that although the proportion of drinkers was similar among Vietnamese

males and American males in the general population, binge drinking was twice as common among Vietnamese males as among non-Southeast Asian males (Amodeo et al., 1997).

Longer settlement time in Australia has been found to have a positive association with less smoking among Vietnamese living in Australia. The smoking rate of Vietnamese migrants being more acculturated is as low as that of the main stream population. However they did not find any significant change in the low rate of alcohol consumption. In addition, the Vietnamese who had lived longer in Australia participated more in physical activity than those who had lived for a shorter period (Brock et al., 2001). Increased daily smoking among Vietnamese was associated with not having a routine medical check, having less than a college, having poor English language skills, using Vietnamese at home and with friends (Rahman et al., 2005).

Less than 1% of Vietnamese women living in the USA smoked. Another study conducted in Vietnam also reported that 4.3% of Vietnamese women smoke compared to 72.8% of males (Jenkins et al., 1997). The low smoking prevalence among Vietnamese women could be as a result of the cultural attitudes that discourage Vietnamese women from smoking. However, they acknowledge that misclassification could be the reason behind the extreme low prevalence of smoking among Vietnamese women, because of the inaccurate self-report health behavior noticed by Wewers et al. (1995) (Mohammad et al).

The prevalence rate of smoking among Vietnamese men was substantially higher than overall smoking rates reported by men in California. Although smoking among Vietnamese male migrants is considered high by U.S. standards, the rate was less than half of that among Vietnamese men living in Vietnam. Except length of stay in the United States, all the other proxy indicators of acculturation were inversely associated with increase daily smoking among Vietnamese in the USA. Respondents who were not fluent in English or who predominantly communicate with family and friends in Vietnamese language were several times more likely to smoke than their English-speaking

counterparts. Acculturation (as measured by the use of English language and proficiency) was a protective factor against smoking (Mohammad et al., 2005).

Somalis

Just as other refugee and immigrant groups, Somalis have been found to face unique health problems and barriers such as lack of healthcare information and knowledge about accessing services, language; low literacy rates; lack of awareness of disease prevention (Kristin et al., 2008). Somalis are predominantly, culturally and/or religiously Muslim. It is socially and culturally unaccepted for women to smoke in Somalia. Therefore the inappropriateness for a woman to smoke in Somali culture caused the need to hide their smoking habit (Kristin et al., 2008). As one female adult stated, “if your neighbors are not Somali ... you will stand outside smoking, but if you live with Somalis ... you won't dare stand outside due to shame. And several youth mentioned: “no one wants a woman with a bad habit and that people say bad things about girls who smoke (Kristin et al., 2008). Although key informants were not specifically asked to comment on perception of smokers, several of them reported that female smokers are perceived as not cultured (Kristin et al., 2008).

Although there were variations across other demographic categories, particularly gender, both the adults and youth participants gave similar reasons for tobacco-use initiation. Some of the common reasons given were: the influence of friends or peer pressure, “fashionable” or “cool”, stress or problems, family influences, fun or socialization, and loneliness. Peer pressure was repeated across almost all demographic categories, and explained by nearly all groups with different Somali proverb: *the second camel follows the steps of the first camel, you are what your friend is, and if you want to know somebody, look at his friends*”. Women appeared to be most influenced by social factors such as: “*fashionable*” or “*cool*”, *fun or socialization*, and *loneliness* more than men. Key informants gave similar reasons, although stress and addiction were more frequently mentioned. They also stated that individuals smoked primarily to appear “civilized” (Kristin et al., 2008).

The three most popular tobacco-use prevention strategies or interventions suggested by all demographic categories includes: medical advice and health education from religious leaders, parents, and family (Kristin et al., 2008). Providing health information about the effects of smoking was found to be an issue raised by all focus groups. Many current smokers also revealed their ignorance about the harmful effect of smoking. Doctors were repeatedly mentioned to be well respected in Somali communities and could help reduce smoking among Somalis by providing health information. Not all but religion was mentioned as an important tool in smoking prevention, and many felt that a strong faith prevents tobacco use. Although the Qur'an does not forbid tobacco use, smoking violates several Islamic principles. Smoking is considered as damaging health and promoting frivolous spending. Islamic leaders were therefore noted as one of the most influential persons to deter smoking among Somalis (Kristin et al., 2008).

Rice pasta and meat were noted to be the main components of diet for Somali living in London. They consumed less vegetables and fruits (McEwen et al., 2009). Beside low consumption of fruit and vegetables, there were also uncertainties with regards to what a healthy diet entails and a stated desire to have more information concerning these issues. The selection of food is based on cultural factors such as traditional diet; social associations of food: for example poverty is associated with eating fruit and vegetables, whereas consuming meat is an evidence of wealth in some cultures (McEwen et al., 2009).

Estonian and Russian

Although Estonian and Russian are member of the former Soviet Union, they differ from one another in several ways, such as historic and socio-economic background, language and culture which all influences health behavior (Lang, 2009). By comparing Estonia and Russia as different countries, it has been documented that the incidence of lung cancer is higher among Russians than Estonians (Rahu and McKee, 2008). The high incidence of lung cancer among Russian men is explained by higher prevalence of smoking (Rahu and McKee, 2008). Lang (2009) explained that the decline in pancreatic cancer cases among Estonian men which was not observed in Russian men is due to increased smoking and

alcohol consumption among Russians which are risk factors for pancreatic cancer. A more extensive use of strong spirits and more prevalent daily smoking was observed among Russian men than among Estonian men for 1990–2000 (Kunst et al., 2003).

Russia has undergone health crisis characterized by premature death, especially among 40–59-year-old males (Abbott, 2002). The increase in mortality in cardiovascular diseases and alcohol-related accidents and poisonings could no longer be hidden by the alarming cases related to alcohol (Cockerham, 2007).

Due to the collapse of the communist regime, the social structure nurturing and reinforcing healthy lifestyle of the individual has not been well established in Russia. Consequently, negative health behavior has become a norm for many people. This lifestyle has been observed by several studies as an entrenched pattern of excessive consumption of strong spirits and binge drinking, heavy smoking, fatty diet, and the lack of health-promoting physical activity (Cockerham, 2005, Men et al., 2005, Palosuo, 2003, Perlman et al., 2003). As explained by Palosuo (2003) “heavy drinking was habitual in Russia long before the recent upheavals and is not necessarily particularly stress-related; on the contrary, drinking has been closely connected with Russian social life, rituals and celebrations”.

The consumption of hard liquor and excessive smoking among males is well-known in Russia (McKeet et al., 2001). At the same time, the Russian diet has undergone a dramatic change since the 1960s and become one of the fattiest in the world (Cockerham, 2007). The little information available on health-promoting physical activity indicates less participation for both Russian male and female. Overall, men are found to engage in negative life style than women (Cockerham, 2007)

Although lower cholesterol levels have been found in populations in the former communist countries in some studies, heart disease and stroke mortality was significantly higher for both men and women in the former communist states than the other European countries

(Cockerham, 2007). High levels of alcohol consumption, smoking and hypertension were again higher among men than among women. Alcohol consumption in the post-communist countries was twice higher than the other European nations in the study (Cockerham, 2007). Similarly, low cholesterol levels with increased risk of cardiac death among middle-age men in Moscow and St. Petersburg has been observed.

High alcohol consumption has been associated with the cardiac fatalities observed. The results indicated that the impact of heavy drinking is more significant for premature cardiovascular mortality for men than cholesterol levels (Cockerham, 2007). Arguably, alcohol consumption has been identified as the single most important lifestyle variable in the Russian health crisis (McKee et al., 2001). In Russia it is socially appropriate for men to drink. Thus drinking alcohol is more masculine – but not feminine and a large gender variations exist in alcohol consumption (Cockerham, 2007).

3. OBJECTIVES OF THE STUDY

The primary aim of the study is to inquire the health behavior of the immigrants and to find out how acculturation affects their health behavior. A comparison of the health behavior among and within Russians, Estonians, Somalis and Vietnamese living in Finland in 2002 is made from a survey conducted by Statistics Finland on the living conditions of immigrants (Pohjanpää et al., 2003). This study also investigates the association of acculturation with the body mass index (BMI) of the selected migrants. To achieve the above mentioned aims, the following research questions are explored:

- Is there an association between settlement time in Finland and the health behavior of the selected migrants?
- Is increasing duration of living in Finland associated with the prevalence of obesity among the selected migrants?
- Are there gender differences in the health behavior and the prevalence of obesity within and among migrant groups by length of stay?
- Are there differences in the health behavior and the prevalence of obesity according to migrants' educational background?
- Are there differences in migrants' health behavior and the prevalence of obesity according to their main activity?

4 METHODS

4.1 Participants

The current study is based on a study carried out among Russians, Estonians, Somalis and Vietnamese living in Finland in 2002 by statistics Finland. Apart from a random sample of 399 Russians who resided in Tampere and Turku, all the remaining participants lived in Helsinki, Espoo and Vantaa. The focus was on these groups because Russians and Estonians form the chunk of the migrants' population in Finland. Vietnamese and Somalis on the other hand, represent the old and new refugees in Finland. Somalis are the largest African origin Muslim group in Finland.

Russians are considered to be those born in Russia or former Soviet Union countries and who speaks Russian or Finnish as their mother tongue; Estonians are people who have been born in Estonia and speak Estonian, Russian or Finnish language as first language. Somalis are those born in Somalia who speaks Somali as their mother tongue. Vietnamese are individuals born in Vietnam who speaks Vietnamese as mother language. Eligible participants were identified from population register. But in the case of Russians additional participants were identified and recruited from Turku and Tampere. All the immigrants born in the countries concern were first selected.

Table 1 Sample size of the study population and their place of residence (Pohjanpää et al 2003, 40)

	Vietnamese	Somalis	Estonians	Russians	Total
Helsinki/Espoo/Vantaa	345	475	494	495	1809
Tampere	-	-	-	199	199
Turku	-	-	-	200	200
Total	345	475	494	894	2208

4.2 Material

Of the random sample of 2 208 immigrants aged 20-65 years, a total of 1 361 individuals participated in the study with a varying response rate of 60% among Russians, 63% among Estonians, 68% among Somalis and 56% among Vietnamese.

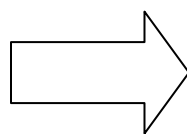
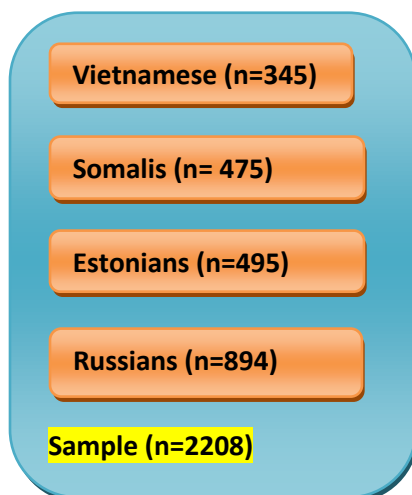
Table 2 Response rate (%) of participants by migrant groups and place of residence (Pohjanpää et al. 2003, 43)

	Vietnamese	Somalis	Estonians	Russians
Helsinki/Espoo/Vantaa	56	68	63	57
Tampere	-	-	-	65
Turku	-	-	-	61
Total	56	68	63	60

Table 3 Number (n) of participants by migrant groups and place of residence (Pohjanpää et al 2003, 43)

	Vietnamese	Somalis	Estonians	Russians
Helsinki/Espoo/Vantaa	193	324	312	280
Tampere	-	-	-	130
Turku	-	-	-	122
Total	193	324	312	532

STUDY SAMPLE



STUDY POPULATION



The study was conducted from April to August 2002. Somali and Vietnamese were interviewed and postal questionnaires were sent to Russians and Estonians. There were about 200 different questions about family and income in Finland, Finnish Language skills and Education, work, social network, health and health habits, use of health and welfare services, experience of violence and housing condition. An anonymous electronic data on the living conditions of Russians, Estonians, Somalis and Vietnamese living in Finland in 2002 was received from Statistics Finland after permission. The researcher has the permission to use the data solely for the purpose of this study. The data was destroyed after the study. Data entry and clearance was done by Statistics Finland. The researcher only received data in SPSS format with manual in Finnish.

4.3.1 Interview of Somalis and Vietnamese

Structured interviews of the Somali and Vietnamese migrant groups were carried out. The data was collected through a face-to-face interview, either in a participant's native language or in Finnish. The computer assisted interviews were conducted either in migrants home or meeting centers for migrants. Before the interview participants were sent letters to explain the study. On an average, an interview lasted for 45 minutes to complete (Pohjanpää et al 2003, 45).

The average interview time for Somali was 48 minutes and 41 minutes for Vietnamese. The personnel who conducted the interview were professionals from Statistics Finland with the help of two on-call interpreters when needed. Participants had the possibility to decide who to interpret when needed. However, minor children were not allowed to interpret. All together 40 percent (%) of the interviews were interpreted. Table 1 indicates the interview interpreter for the migrants (Pohjanpää et al 2003, 45).

Table 4 Interviews interpreter for migrants, % (Pohjanpää et al. 2003, 45)

	Somalis	Vietnamese
Interpreted	36	47
Who translated		
Professional interpreter	44	71
Spouse	25	7
Grown up child	19	9
Friends	12	3
Other	1	10
Total	100	100

4.3.2 Postal questionnaire to Russians and Estonians

All potential participants received information about the study via a postal mail, before the postal questionnaires were sent. The questionnaires were mailed back in prepaid addressed envelopes to the study team.

Both open ended and multiple choice questions were included in the postal survey. There were 30 pages with a little bit less than 200 questions. Except minor technical variations, the questions were the same as those in the interview. After the first mailing 700 participants being 50% responded. A reminder was sent twice which yielded 144 more responses. Data was collected between April and August 2002. Participants had the possibility to answer the questions in Finnish, Russian or Estonian language. The table below indicates the language in which migrants returned forms (Pohjanpää et al 2003, 46).

Table 5 Language in which migrants returned forms, % (Pohjanpää et al 2003, 46)

	Russians	Estonians	Total (N)
Language of questionnaire			
Finnish	46	72	469
Estonian	0	23	73
Russian	54	5	302
Total (N)	532	312	844

4.3.3 Justification for different data collection methods

Different data collection methods were employed due to economic reasons and experiences from previous international studies. Previous experiences indicate that Somalis and Vietnamese prefer interview while Russians and Estonians are more used to questionnaire. Prior to the study, an opinion poll of the migrants groups to find out which data collection method they would prefer indicated that Somali and Vietnamese are more comfortable with interview than questionnaire. Russians and Estonians on the other hand, opted for the questionnaire. The different methods used for data collection were therefore suitable to the various cultures (Pohjanpää et al., 2003, 44-46).

4.4 Ethical Considerations

Ethical guidelines defined in the Declaration of Helsinki (World Medical Association, 1964 revised in 2008) were followed during the study. Also permission and approval has been asked from Statistics Finland to use the data on the living conditions of Russians, Estonians, Somalis and Vietnamese living in Finland (Pohjanpää et al., 2003). For confidentiality and privacy, no record of the names or personal social security numbers of participants were made, nor in any way associated with the responses of the respondents. Identification codes were used to distinguish between the nationalities.

All potential participants received information about the study via postal mail, and in face-to-face encounter before making a decision to participate. Prior to the interviews, those interested to participate were informed about the voluntary nature of the study, confidentiality, the right to discontinue the study at any point one wants and the right to ask for information.

4.5 VARIABLES

Health behavior Variable

Smoking and drinking habits as well as participation in sufficient health promoting physical activities are used as measures of migrants' health behavior.

Smoking: The definition of daily smoking is the same as the World Health Organization's recommendation: it is defined as regular smoking during which the person has smoked at least 100 cigarettes, has smoked for at least one year and smoked during the day of the interview or the day before (Pohjanpää et al., 2003, 112-113).

Alcohol: Alcohol use is determined by the question on the use of alcohol in the last 12 months. Answers are categories into either used or haven't use (Pohjanpää et al., 2003, 114). It must be pointed out that there are several ways of measuring alcohol use. However for convenience reasons, alcohol use in the last 12 months was used to measure the drinking habit of the migrants.

Physical Activity: Sufficient health promoting physical activity is defined as any self-reported activity at least four times a week and at least half an hour each time, causing slight breathlessness and sweating (Pohjanpää et al., 2003, 116-117). Insufficient health promoting physical activity is therefore defined as any self-reported activity less than four times a week.

Obesity: The prevalence of obesity is determined by the body mass index of the respondents. The body mass index (kg/m²) is measured by measuring the height and weight of the respondents. It is calculated by dividing weight (kg,) by the square of height (in meters). Body-mass index is calculated with the original length and weight variables. The answer is rounded to the nearest whole number. Persons whose body mass index is 29 or more are classified as obese (Pohjanpää et al., 2003, 109).

Ethnicity: This is measured as country of origin. We distinguished four migrant groups: Russians, Estonians, Somalis and Vietnamese.

Gender: Gender is measured as self-reported male or female.

Length of stay in Finland: Length of stay of the migrants is measured by the year in which migrants had moved to Finland. It is then divided into three categories: Shorter stay (arrived in 1997 or after or had lived for 2-6years); Longer stay (arrived between 1993 – 1996 or had lived 7-10 years); and longest stay (arrived in 1991 or before or have lived for 11 years or more).

Educational background: Respondents' educational background is determined by the number of years studied. It is categorized into: 1= no education or 6 years of education, 2= 7-12 years of education and 3= more than 12 years of education

Main activity: Main activity of respondent is classified into four categories: working (wage earners and entrepreneurs), student, unemployed, economically inactive (*maternity* - paternity or parental leave or to manage their own households and retired)

4.6 Variables in Full sample

Descriptive statistics for the variables in the full sample and for each of the migrant group samples are reported by gender in Table 6

Table 6 Descriptive statistics for all study variables

	Vietnamese (n)		Somalis (n)		Estonians (n)		Russians (n)	
	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)
Smoking status								
Smokes Daily	48	3	21	3	38	20	35	16
Smoke seldom	4	2	7	1	10	14	12	10
Don't smoke	48	95	72	96	51	64	53	70
Alcohol use in 1year								
Yes	82	34	8	1	95	83	91	82
No	18	66	92	99	3	16	8	17
Physical Exercise								
Sufficient	23	42	25	23	31	27	19	24
Insufficient	71	56	74	70	63	70	74	69
Can't due to sickness	6	2	1	7	6	3	7	7
BMI								
<20 underweight	6	19	3	7	2	3	1	4
20-24 normal weight	76	66	64	38	49	64	45	54
25-28 over weight	18	14	30	37	41	21	40	33
29 or more(obese)	0	0	3	18	8	12	14	10
Educational Status								
0-6yrs.	50	51	20	49	4	9	14	4
7-12yrs.	37	45	62	46	66	60	61	64
13yrs or more	13	4	18	5	30	31	25	32
Main Activity								
Working	57	42	40	8	85	67	61	47
Unemployed	23	13	39	17	6	8	20	26
Students	13	11	20	11	6	9	13	9
Inactive(retired/home)	7	34	1	64	3	16	6	18
Length of stay in Finland								
11yrs or longer	75	60	57	11	29	38	30	30
7-11yrs	10	16	29	57	52	48	36	37
2-6yrs	15	24	14	32	19	14	34	33

4.7 Analysis

SPSS version 17 was used for windows as statistical software for all the analysis. Analysis was first made to compare the health behavior of the various migrants groups to find out the distribution of the data. The health behavior variables were then categorized to suite the objectives of the study. All other variable were categories as described in 4.6.

To know the health behavior of migrants groups according to length of stay, cross tabulation was used. Smoking status, alcohol use, participation in physical activity and obesity were selected and put in the “Rows”, Length of stay in the “column” while Nationality was selected in the first layer. Percentages in the columns of the cells were then selected.

Further comparisons were made using gender as reference in the second layer to find out gender differences in the health behavior and the prevalence of obesity within and among migrant groups by length of stay in Finland. The impact of migrants’ educational background on their health behavior and the prevalence of obesity were also analyzed. Here we categorized the health behavior of the various migrants into the three categories of the educational background using cross tabulation. Our analysis also considered the influence of working status on migrants’ health behavior and the prevalence of obesity. Pearson’s chi-square test was used to measure the statistical power of the associations between migrants’ health behavior by length stay, gender, education and main activity. Significance was determined at the 0.05 level.

5. RESULTS

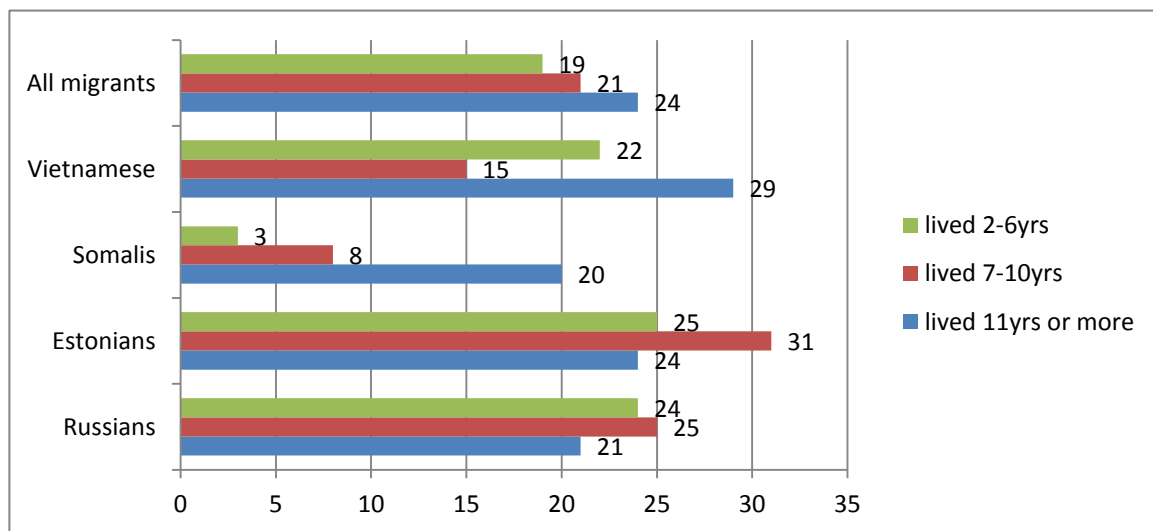
5.1 The health behavior and obesity of migrants by length of stay

Smoking and drinking habits as well as participation in sufficient health promoting physical activities are used as measures of migrants' health behavior. Length of stay in Finland was categorized into 2-6 years; 7-10 years; and 11 years or longer. There was no information about the length of stay of 11 (0.8%) participants, of which 7 were Russian and 4 were Estonians.

Daily smoking among the migrant groups

The definition of daily smoking is the same as the World Health Organization's recommendation as described earlier. 13 Russians and 7 Estonians who did not answer the question were eliminated from the analysis. Although the findings did not have statistical power, longer settlement time in Finland seems to have an association with increase daily smoking among the selected migrants as a group (see figure 1 for details).

Figure 1 Daily Smoking among migrants by length of stay in Finland (%)



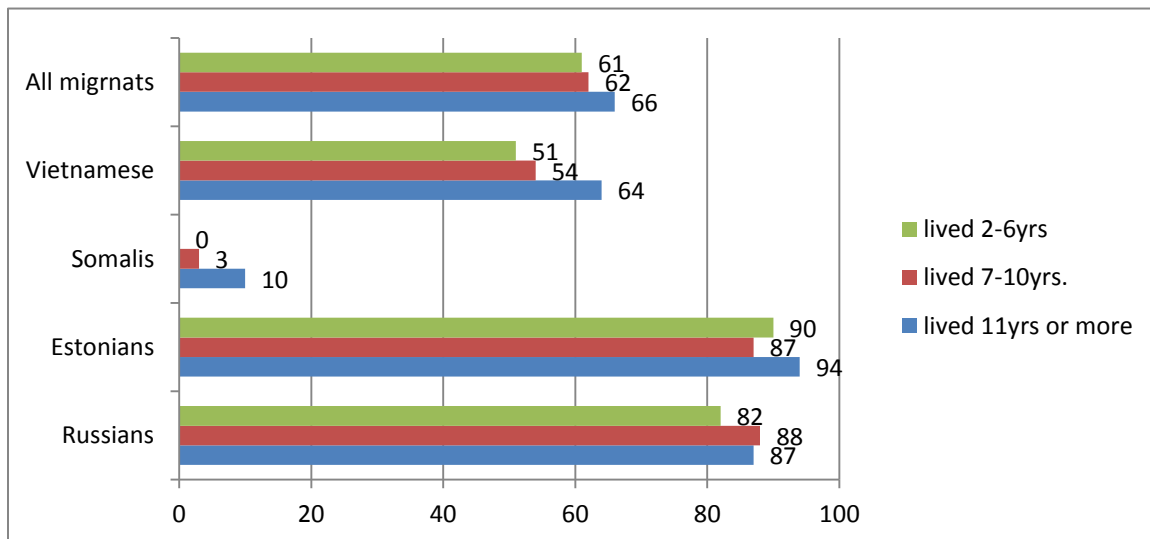
When analyzed the effect of length of stay on smoking among the various migrants groups, the results indicate a significant association between increased length of stay in Finland and increased daily smoking among Somali migrants. Only 3% of the Somalis who had

lived for 2-6years smoked, 8% of those who had lived for 7-10years smoked and 20% of those who had lived for 11years or longer smoked daily. The results for the Vietnamese did not follow any particular trend. Though, those who had resided in Finland for the longest period smoked more. For Estonian and Russian migrants, the results seems to indicate that those who had lived in Finland for 7-10years smoked more than those who had resided in Finland for less than 7 years and those who had resided for more than 10years.

The use of alcohol among migrant groups

Alcohol use is determined by the question on the use of alcohol in the last 12 months (Pohjanpää et al., 2003). Those who did not answer the question (7 Russians and 5 Estonians) were not included in the analysis. As shown in figure 2, increased length of stay in Finland has some effect (though not significant) on increased use of alcohol among migrants as a group.

Figure 2 Alcohol use in the last 12months among migrants by length of stay in Finland (%)



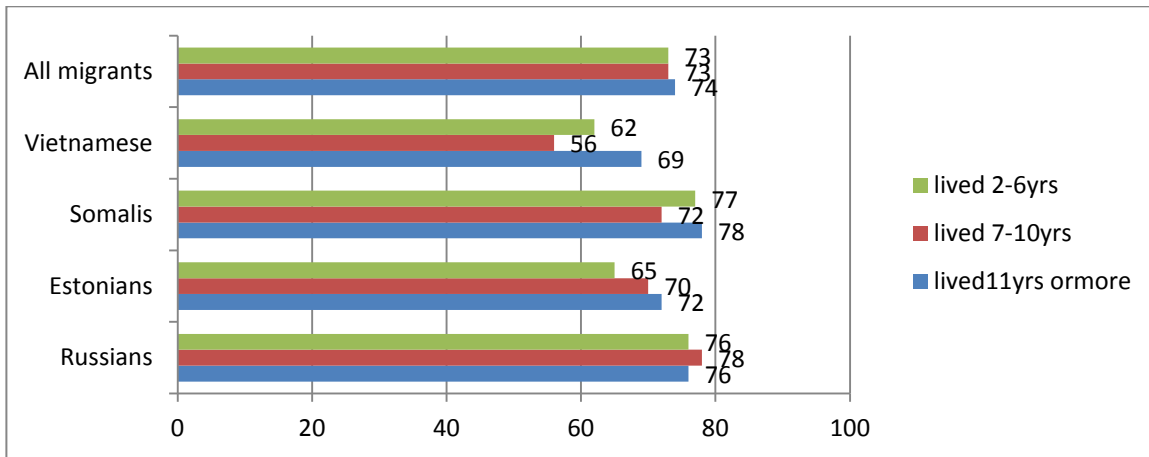
When reviewing the impact of length of stay on the use of alcohol among migrant groups separately, it was significantly noted that, longer settlement time in Finland is associated with increased use of alcohol among Vietnamese and especially Somali migrants. As 51% of Vietnamese who had lived in Finland for 2-6years had used alcohol, 64% of those who had stayed for longest period (11 years or more) had used alcohol in the last 12 months.

None of the Somali migrants who had lived in Finland for 2-6 years had use alcohol in the past 12 months while only 3% of those who had lived for 7-10 years had use alcohol and 10% of those who had lived for 11years or more had use alcohol in the last 12 months. Though, alcohol use is notably higher among Russian and Estonian migrants, increasing duration of stay in Finland does not seem to correlate with use of alcohol among Estonian and Russian migrants as shown in figure 2 above.

Physical activity among migrants

Sufficient health promoting physical activity is defined as any self-reported activity at least four times a week and at least half an hour each time, causing slight breathlessness and sweating (Pohjanpää et al., 2003). The is findings is based proportion of migrants who participated in physical activity less than 4/week, excluding 10 Russians, 8 Estonians, 8 Somalis and 1 Vietnamese who did not respond to this question. Also, 27 Russians, 5 Estonians, 6 Somalis and 7 Vietnamese who could not participate in physical exercise due to injury or sickness were eliminated from our analysis. Altogether, 5.3% of the respondents were eliminated.

Figure 3 Migrants' participation in physical activity less than 4times/week by length of stay in Finland



As indicated in figure 3, a huge chunk of the migrants did not engage in sufficient physical activity. 73% of the new comers did not participated in sufficient physical activities. Just as 74% of those who had lived for 7-10 years and those who had resided for 11years or longer participated in physical activity less than 4time/week. Increasing duration of stay in Finland does not seem to have any association with participation in physical activity among all migrants groups. However for the Estonian migrants, there was a slight gradient (though insignificant) indicating that length of stay in Finland is somehow associated with less participation in physical exercise (for details see figure 3 above).

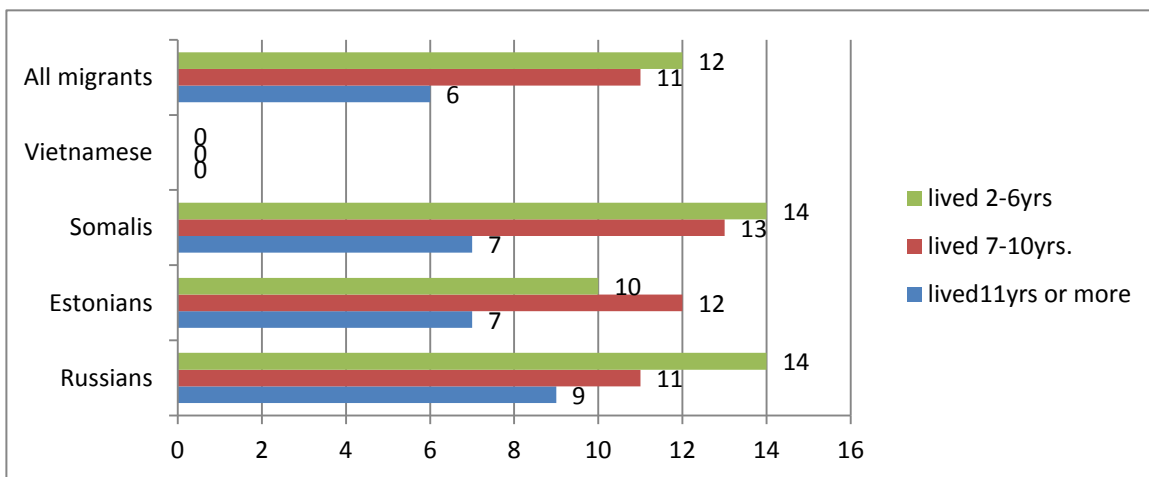
Obesity among migrant groups

The prevalence of obesity is determined by the body mass index of the respondents. It is calculated by dividing weight (kg.) by the square of height (in meters). The answer is rounded to the nearest whole number. Persons whose body mass index is 29 or more are

classified as obese (Pohjanpää et al., 2003). 12 Russians, 7 Estonians, 11 Somalis and 2 Vietnamese were excluded because they did not answer the question.

Considering migrants as a group, increased length of stay in Finland seems to have an association with low prevalence of obesity. Obesity was less recorded among those migrants who had lived in Finland for a longer period than those who had resided for a shorter period. As the length of stay increases the proportion of migrants who are obese decreases (see details in figure 4 below).

Figure 4 Prevalence of obesity among migrants by length of stay in Finland (%)



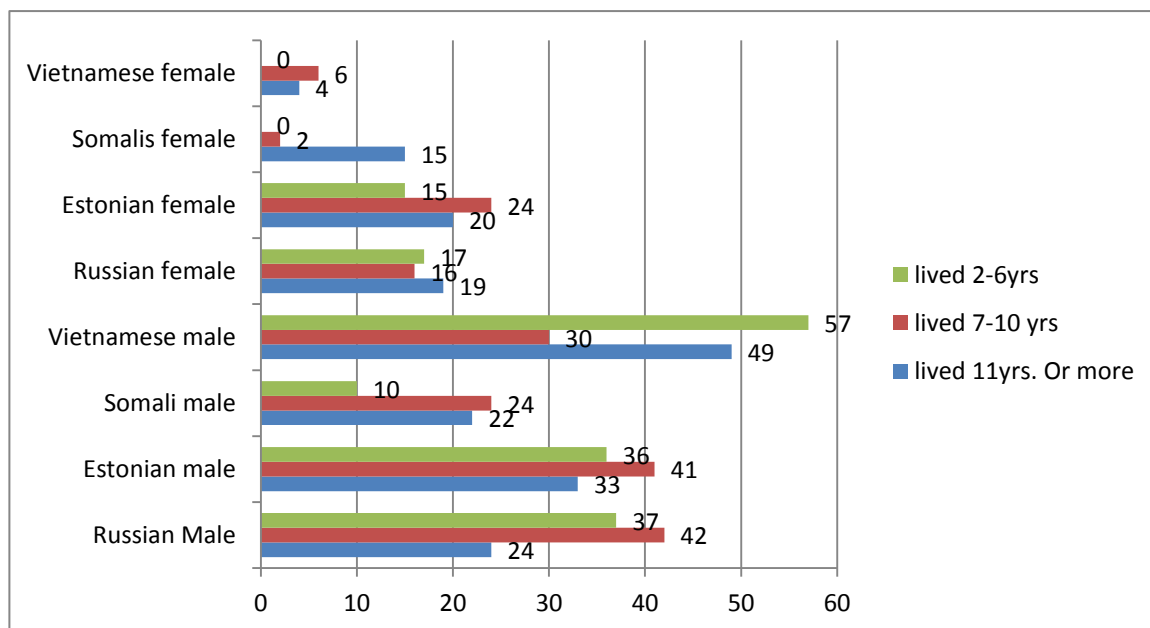
The prevalence of obesity by length of stay among migrant groups separately indicated that, none Vietnamese were obese. For the Somali and Russian migrants it was observed that increasing duration of stay in Finland significantly associated with less prevalence of obesity. The prevalence of obesity by length of stay in Finland among Estonians presented mixed results. Although obesity was more prevalent among those who had lived in Finland for 7-10years, no trends could be seen in the prevalence of obesity by duration of stay in Finland among Estonians.

5.2 Migrants' health behavior and obesity by length of stay in Finland and gender

Daily smoking among male and female in the migrant groups

Daily smoking among Vietnamese and especially Somali women is significantly associated with length of stay in Finland. Smoking was observed only among the Vietnamese women who had lived in Finland for 7 years or longer. None of the Vietnamese and Somali women who had lived in Finland for 2-6 years smoked. And of those Somali women who had lived for 7-10 years only 2% smoked whereas 15% of those who had lived for 11 years or longer smoked. Length of stay in Finland does not appear to have any effect on the smoking habit of Estonian and Russian women living in Finland as shown in figure 5.

Figure 5 Daily Smoking among migrants by length of stay in Finland and gender (%)



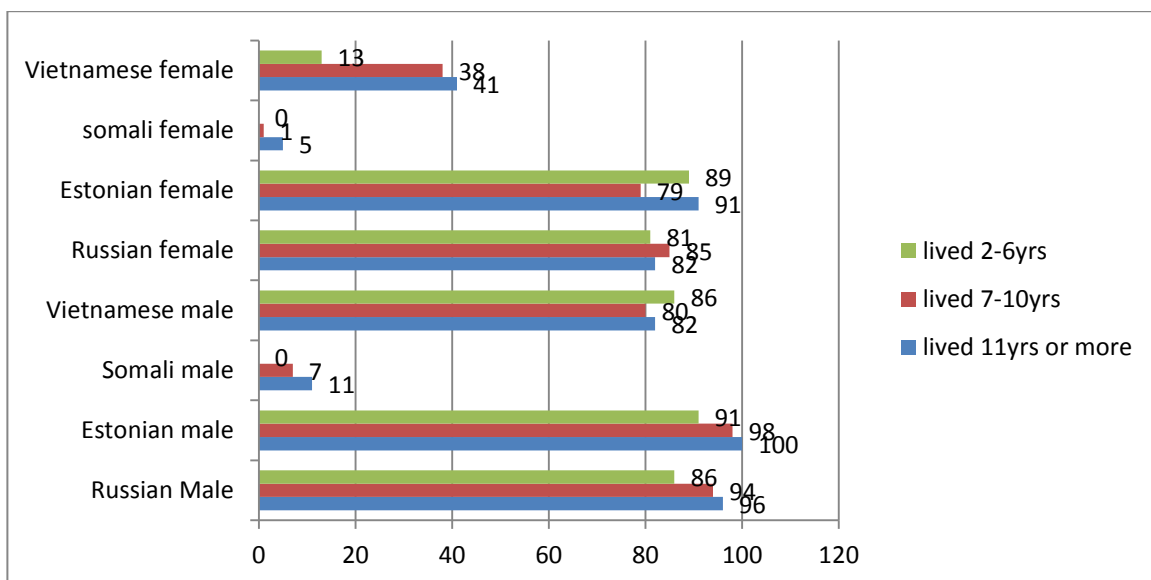
The smoking habit of the migrant men living in Finland does not follow any trend with regards to length of stay in Finland. Vietnamese men who have lived in Finland for a shorter period (2-6 years) smoked more while those who had lived for 7-10 years smoked less. The Somali men who had lived in Finland for 2-6 years smoked less than their

counterparts who had lived in Finland for 7 years or longer. Length of stay in Finland does not predict the smoking habit of Estonian and Russian in any direction. The Estonian and Russian men who had lived in Finland for 7-10years smoked more than those who had lived in Finland for 2-6 years and those who had lived for 11years or longer (see details in figure 5 above).

Alcohol use in the last 12months among male and female in migrant groups

The use of alcohol among female Vietnamese and Somali women seems to follow a similar pattern, although the proportions differ. Alcohol usage among Vietnamese women increases significantly among those who had lived longer in Finland. Somali women barely use alcohol. Only 1% of the Somali women who had lived in Finland for 7-10years and 5% of those who had lived for 11 years or longer had used alcohol. Although alcohol use in the last 12 months was common among Estonian women and Russian women, their drinking habits do not have any association with length of stay in Finland.

Figure 6 Alcohol use in the last 12 months among migrants by length of stay in Finland and gender (%)

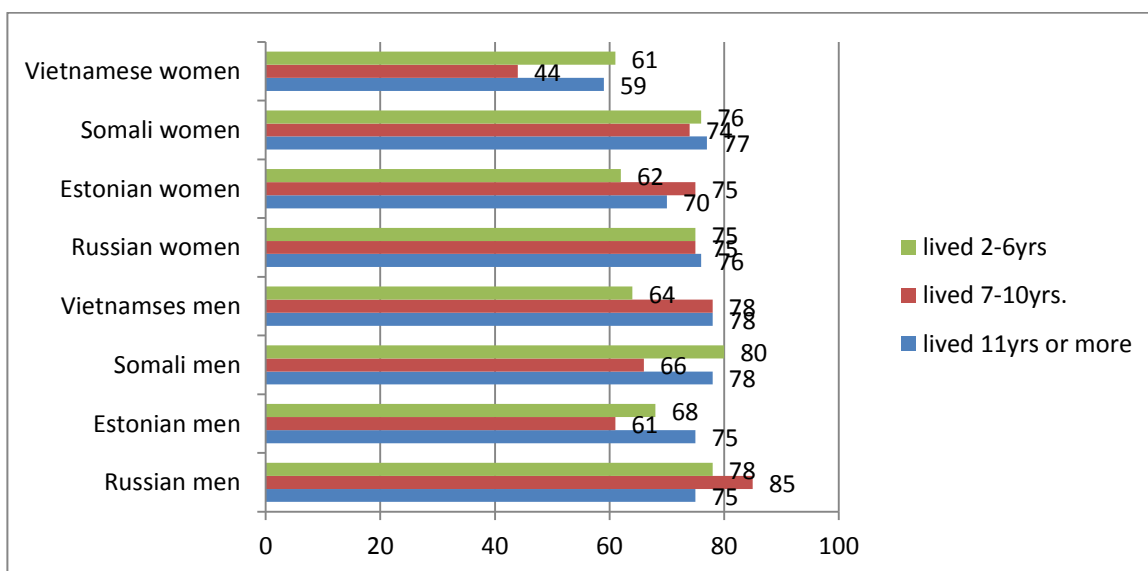


The proportion of Vietnamese men who had used alcohol in the last 12 months was extremely higher than their women, but does not follow any direction in association with length of stay in Finland. For the Somali men, their drinking habit follows a similar pattern as their women. Although not significant, the Somali men who had stayed the longest period in Finland had used more alcohol in the last 12 months. Estonians and Russians in general have similar drinking habits. Use of alcohol in the last 12 months for both sexes was very high among both migrant groups. The proportion of those who had used alcohol in the last 12 months varies according to length of stay and gender. Alcohol use seems to increase progressively among Estonian and Russian men who had lived longer in Finland (see figure 6 for details).

Physical activity among male and female in migrants groups

Surprisingly, Estonian and Russians had lived in a similar type of climate as in Finland, and thus are familiar with all seasonal Variations and sporting activities – whereas Somalis and Vietnamese have to adjust themselves to these seasonal variations.

Figure 7 Migrants' participation in physical activity less than 4times/week by length of stay in Finland and gender (%)

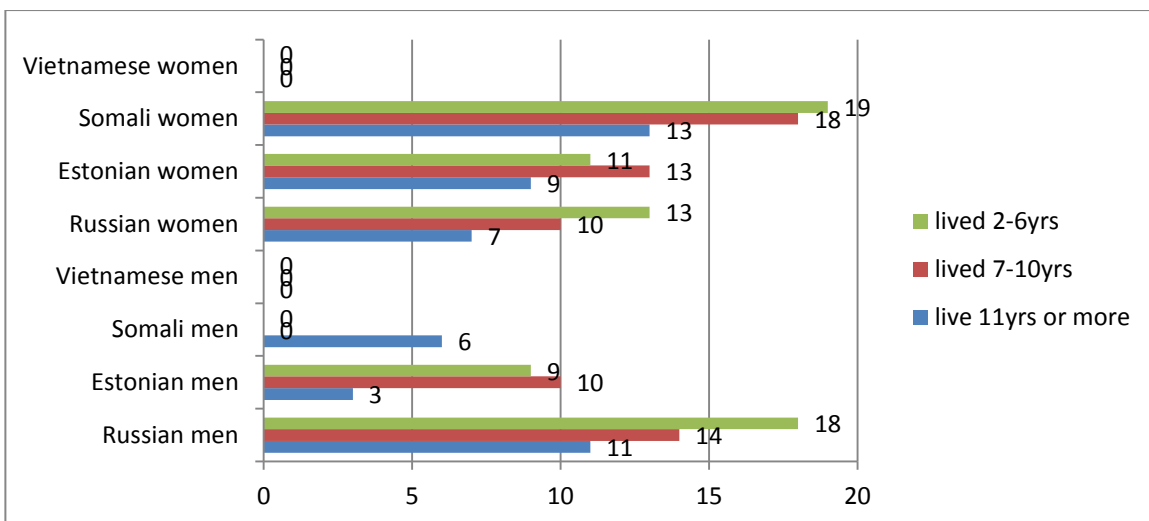


Migrants' participation in physical activities did not show any significant variation by gender, length of stay in Finland and by ethnicity. In general, a huge chunk of migrants reported participating in physical activities less than 4/week but no clear trends could be observed as shown in figure 7.

Obesity among male and female in migrant groups

None of the Vietnamese was obese. Longer settlement time in Finland seems to associate with less prevalence of obesity among Somali and Russian women, though statistically insignificant. The longer the length of stay in Finland, the less cases of obesity was recorded among Somali and Russian women. There were also proportional variations. Obesity was higher among Somalis women than among Russian women. For the Estonian women, obesity was higher among those who had resided in Finland for 7-10 years than those who had resided for 2-6 years and those who had lived for 11 years or longer.

Figure 8 Obesity among migrants by length of stay in Finland and gender (%)

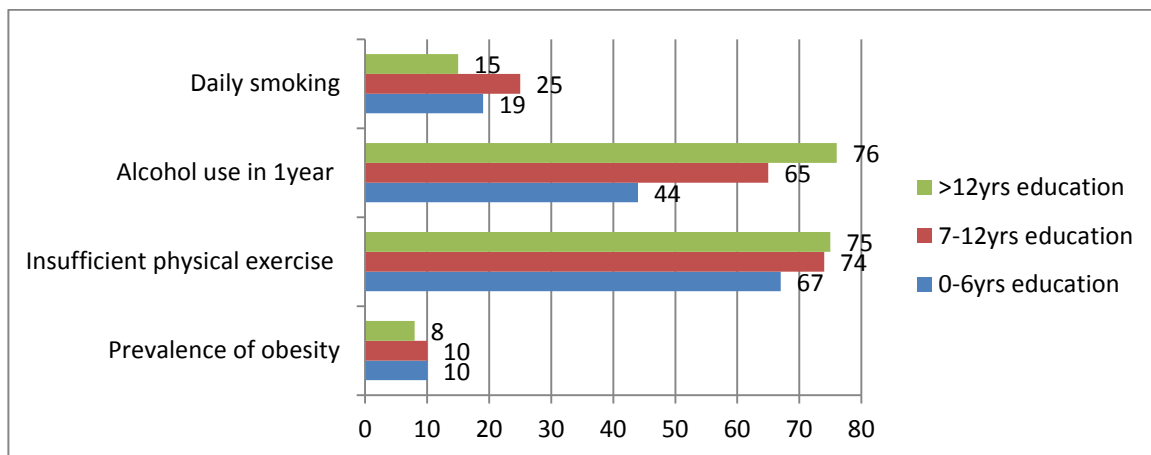


In contrast to their women, the only cases (6%) of obesity among the Somali men were recorded among those who had stayed in Finland for the longest period. In the case of the Estonian men, no clear pattern of the prevalence of obesity with regards to length of stay was observed. Among Russian men, increased length of stay in Finland was associated with lower prevalence of obesity. 18% of those who had lived in Finland for 2-6years were obese, 14% of those who had stayed for 7-10 years were obese while 15% of those who had lived for 11years or longer were obese.

5.3 Impact of education on migrant's health behavior and obesity

The investigations further explore how migrants' educational background impacts their health behavior and the prevalence of obesity. Figure 9 shows a summary of the health behavior and prevalence of obesity according to the educational background of the migrants as a group. For separate analysis of the various migrant groups refer to figures 1-4 in the appendix. There was no information about the years of education from 31 (2.3%) of the participants of which 12 were Russians, 9 Estonians and 1 Vietnamese. These were eliminated from the analysis.

Figure 9 Migrants' health behavior and the prevalence of obesity by number of years of education



Less years of education is significantly associated with daily smoking among Russian migrants. The prevalence of daily smoking among all the other migrant groups was more common to those who had studied for 7-12 years as compare to those who have studied for 0-6 years and those who have studied for more than 12 years or more (for details see figure 1 in appendix).

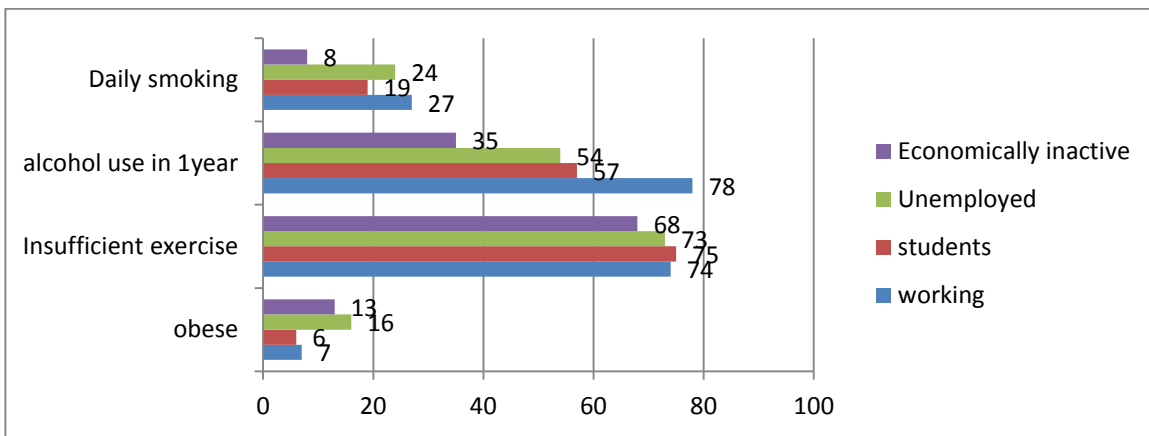
Educational years were recorded to have significant impact on the use of alcohol among the migrants as a whole. When analyzing the groups separately, it was observed that Somali migrants hardly drink. However for the few Somali migrants who had used alcohol, increased number of years of education correlates to increased use of alcohol in the last 12 months. Surprisingly, it was noted that an increased educational years is associated with insufficient participation in health promotion physical activity among all the migrants as a group. This scenario was not repeated while focusing on the migrant groups separately.

The prevalence of obesity in an association with years of education shows a different situation among all the migrants groups. For the Vietnamese migrants nobody was obese. On the other hand, obesity was more common among Somalis (women) than all other migrant groups especially among the Somalis who had less years of education. Estonian migrants who were less educated were more obese than their counter parts that were more educated. The prevalence of obesity was less among the Russians who had studied for more years than those who had studied less. But obesity was higher among Russians who had studied for 7-12 years than those who had studied for 0-6 years and those who had studied for more than 12 years (see figure 4 in appendix for details).

5.4 The impact of main activity on migrants' health behavior and obesity

The study tries to find out if an association between migrants' working status and their health behavior and obesity could be established. There were 61 (4.5%) respondents of which 44 Russians, 7 Estonians, 6 Somalis and 4 Vietnamese who were eliminated from the analysis, because they did not answer the question or answered as doing something else. Figure 10 describes the health behavior and prevalence of obesity of migrants as a whole according to their main activity. Detail description of the various migrants groups can be seen from figures 5 -8 in the appendix

Figure 10 Migrants' health behavior and prevalence of obesity by main activity



Daily smoking was observed to be significantly more frequent among Somali and Estonian migrants who were working (wage earners and entrepreneurs) than the unemployed, students and economically inactive. On the Contrary, the unemployed participants from Vietnam and Russia were noted to smoke more than their counterparts who were working. However, daily smoking was higher among Russian students than their counterparts. As expected, daily smoking among the economically inactive participants, from all the migrant groups was less frequent as compare to the unemployed, students and working respondents, except for Russians (see figure 5 in appendix for details).

Working was associated with high prevalence of alcohol use among all the migrant groups. The working migrants reported to have used more alcohol in the last 12 months than those who were unemployed, student or economically inactive. But from the Russian migrants, the proportion of students who had used alcohol was slightly higher than those working, unemployed and economically inactive (for more details refer to figure 6 in appendix).

No trends in migrants' participation in physical activity and their main activity could be observed. But it was surprisingly noted that the Vietnamese and Russian migrants who were working participated less in physical activities than their mates who were economically inactive, unemployed or student. The Somali unemployed participated less in physical activities than those who were working or economically inactive. The students among the Estonians were noted to participate less in physical activity (refer to figure 7 in appendix for details).

Obesity was not found among the Vietnamese migrants. Unemployment was statistically significantly associated with increased obesity among the Estonian and Russian migrants. But among the Somali migrants, the economically inactive migrants were more obese followed by the unemployed (more details can be found from figure 8 in the appendix).

6.0 DISCUSSIONS

6.1 Possible explanations to the main findings of the study

The purpose is to discuss the thinking that lies behind the findings of this study and to review some approaches set for reducing the disparities in health behavior of migrants in Finland. The significance of broader social policy measures in reducing health inequalities, referring to experiences from other countries is touched. Furthermore, considerations of the problems as well as the opportunities in reducing health inequalities among migrants in Finland are discussed.

The primary aim of the study was to inquire the health behavior of the immigrants and to find if disparities exist within and among the health behavior of the various ethnic groups according to the settlement time in Finland. A comparison of the health behavior among and within Russians, Estonians, Somalis and Vietnamese living in Finland in 2002 is made from a survey conducted by Statistics Finland on the living conditions of immigrants (Pohjanpää et al., 2003). The ultimate aim was to find out if an association could be seen between the health behavior within and among the migrants groups according to their length of stay in Finland, their educational background, and their main activity in Finland.

While trying to find possible explanations to the findings of these studies, it is important to keep in mind that factors other than acculturation may contribute to the observed ethnic variations in the health behavior. Demographic variables like socioeconomic status, religious affiliation, and marital status of the immigrants may differ among the ethnic groups and also change as they stay longer in Finland. For example Estonians and Russians may differ from Vietnamese and Somalis in Finland. These differences also may account for differences in health behavior and confound the influence of acculturation. Both in Finland and in some of the migrants' home countries, the health behavior have changed considerably over the past few decades. These changes may confound the effect of acculturation. The socioeconomic status of the immigrants has changed over the years

(e.g., educational attainment and economic status may have improved). These factors may influence health behavior independently of the degree of acculturation. Migrants who immigrated to Finland were not representative of the general population of their homelands. Accordingly, the health practices of the immigrants may have already differed from those of the general population in those countries.

The findings reveal that there are ethnic disparities in the health behavior of the migrants and that being a Vietnamese, Somali, Estonian or Russian to some extent could determine the health behavior of the migrants. Daily smoking was particularly high among Vietnamese in general and Somalis barely smoked. Alcohol use in the last 12 months was very common among Estonian and Russian migrants whereas very few Somalis had used alcohol in the last 12 months.

Surprisingly, not much difference could be observed with regards to participation in physical activity by, length of stay in Finland, language proficiency and gender. Estonians and Russians who had lived in a similar type of climate, and thus are familiar with all seasonal variations and sporting activities had similar habits regarding their participation in physical activity as the Somalis and Vietnamese who have to adjust themselves to these seasonal variations. Although, it was observed that those who are fluent in Finnish language participated more in physical activity, it was insignificant to draw any conclusions. This observation is quite difficult to explain. Obesity was significantly associated with acculturation among the migrants. Except for Vietnamese where there was no case of obesity, for the other migrant groups those who have resided for a longest period and those who are fluent in Finnish were less likely to be obese.

Gender variations within and among the migrants health behavior was very clear especially in the drinking and smoking habits of the subjects. Using cross tabulations, we found that smoking and alcohol use differs significantly for males and females among different ethnic groups. Males were more likely to smoke than their female counterparts

and a same scenario is seen in Finnish population-25% males and 19% females smoked daily (Helakorpi. et al., 2003).

Generally, Vietnamese men, especially those who had resided in Finland for the longest period smoked more while their women hardly smoked. However it must be acknowledged that there were no clear trends in the smoking habits for Vietnamese men according to length of stay in Finland. But for Vietnamese women, longer settlement time in Finland seems to be detrimental factors for daily smoking. The few Somalis (both genders) who reported smoking daily were those who had lived in Finland for the longest period and those who were fluent in Finnish language. The acculturation effect on smoking was even more significant for Somali women than their men.

This observation can be partially due to the shift in perceived cultural and religious norms from the country of origin to the host country. Thus, drinking which is socially or religiously unaccepted in Somali society is a common practice in Finland. Furthermore, the acculturation effect on drinking and smoking could be as a result of how alcohol use and smoking are perceived in Vietnamese, Somali, and Finnish societies. The behavior, perception, and attitudes towards drinking and smoking differ among migrants countries of origins (Zhang & Wang, 2008). In some countries drinking and smoking are socially acceptable and even necessary for men, while it is socially unacceptable for women to smoke (Fu, et al., 2003). On the other hand, the use of alcohol and smoking in western societies is becoming more and more unacceptable, but it is liberal for both sexes. As a result, on migration, Vietnamese (women) and Somalis (both genders) seem to adapt to the norms in Finland or the liberalization of smoking and alcohol usage and start drinking and smoking. The opposite appears to be the case for Somalis where smoking is not liberal. As they get to Finland where smoking is not restricted, they start smoking.

Gender variations in alcohol use emerged significantly within and among the ethnic groups, especially for Vietnamese and Somalis. Males again, were typically more likely than their female counterparts to engage in this behavior. An increased use of alcohol was

associated with longer settlement time in Finland and proficiency in Finnish language among Vietnamese women and Somalis (both genders), although the proportions were very less. The very few Vietnamese (women) and Somalis (both sexes) that had used alcohol were those that had lived in Finland for longer period and those that were fluent in Finnish language. Majority of Estonian and Russian (both genders) had used alcohol for the last 12 months.

However, it was observed that longer settlement time in Finland and being fluent in Finnish language was associated with increased use of alcohol among Russians men. An observation, which could probably be a financial issue, especially for newcomers who might be struggling with their finances, alcohol can be extremely expensive and irrelevant. Presumably, the rise in alcohol use that is associated with longer settlement time in Finland and language assimilation among Vietnamese Women and Somalis (both genders) reflect the influence of the dominant culture. Alcohol use is less prohibitive and less gender restricted in Finland than in traditional Vietnamese and Somali cultures. Alcohol is more readily available in Finland than in Vietnam and in Somalia. Thus the social environment may probably play an important role in determining the drinking behavior of these migrants. For example, cultural norms that prohibit or emphasize moderate drinking may result in lower alcohol consumption. Accordingly, changes in drinking norms that are more permissive toward alcohol consumption should lead to increased consumption levels. This normative interpretation of acculturation on drinking suggests that alcohol use among Vietnamese and Somalis can possibly converge with the patterns among Finns.

As mentioned above, obesity was not prevalent among Vietnamese migrants. However, obesity was less associated with increased length of stay and language proficiency among the remaining migrants groups (both sexes) except for Russian men where the opposite was the case. The high prevalence of obesity among the newcomers could be due to financial barriers. New comers might not have the financial means to purchase low fat foods which are expensive. Also, outdoor and indoor sporting activities which can help

cut down weight are equally expensive in Finland. Contrarily, the low prevalence of obesity among those who had stayed in Finland for the longest period might be due to more opportunities to purchase low fat foods and to engage in health promoting behaviors resulting from increased stability over time.

Societal influence could also partially explain why obesity was less among the some of the migrants who had resided in Finland for the longest period. Although obesity is an emerging global public health problem, malnutrition has historically been and it is still a critical challenge in developing countries. Therefore, obesity is differently understood across cultures. In some sub-Saharan African countries, there is no such definition for obesity. Instead, overweight and obesity have been historically seen as an evidence of wealth, good health and indeed good living. On the other hand, Finland like many other western societies frowns against obesity. These cultural preferences for large body size which is prevalent in developing countries were also reported among westerners until the mid-20th century. The shift from large to thin and cylindrical body size preference observed in the developed world has been enthusiastically promoted by the media, especially in television advertising. So as some ethnic minorities stay longer in Finland they may westernize their health behavior by losing weight and adapting to low fat foods.

Some variations were recorded in the smoking habit of the migrants with regards to the years of education. Although insignificant, it does appear that, overall, education is associated with decreased daily smoking among all the migrants. Only 15% of the migrants with more education versus 19% of those with less education smoked as compared to 17% Finns with more education and 26% Finns with less education who smoked in 2003 (Helakorpi et al., 2003). No clear trends could be seen between in the association of alcohol use and years of education among the ethnic groups separately. But there was a small gradient, suggesting that more years of education is associated with increased use of alcohol among Somalis. Unexpectedly, for the migrants as a whole more years of education is associated with increased use of alcohol. Years of education did not have any significant influence on participation in physical activity among the various

ethnic groups. Somalis who were less educated were more likely to be obese than the more educated. However the association between years of education and obesity could not be seen among Russian and Estonian migrants.

Under normal circumstances, education increases opportunities to acquire and comprehend knowledge about healthy living habits. But the results of this work do not seem to figure out the impact of education on migrants' health behavior. This might to some extent be so because education may not necessarily predict the socio-economic status of migrants in Finland as it would in the main stream population. Having good education hypothetically enhances the chances of securing a good job and potentially increasing the income level (Department of Health 2002). But is this the reality for migrants living in Finland? There is the temptation to speculate that perhaps, migrants in Finland with good education are not enjoying the fruits of education in Finland. Probably, why not much difference could be seen in the health behavior of the migrants with regards to the years of education.

The study confirms that, being unemployed was highly associated with daily smoking among the Russians and especially Vietnamese migrants. The opposite observation was seen among Estonians and Somalis where daily smoking was high among those who were employed. However for the migrants in general, daily smoking was slightly higher among the working class (27%) than the unemployed (24%). Daily smoking among Finnish adults shows a contra scenario, 33% of the unemployed smoked, while 22% entrepreneurs, 13% upper white-collar workers, 20% lower white-collar workers, and 33% blue-collar workers smoked daily (Helakorpi et al., 2003). Although no significant relation could be drawn between main activity and alcohol use among the various ethnic groups, students and the employed migrants were noted to have used more alcohol in the last 12 months. The differences in daily smoking and alcohol use of the migrants and the main stream population according to the main activity seem to be somehow a financial issue on the part of the migrants. Pohjanpää et al. (2003) reported that majority of ethnic groups living in Finland belong to lower socioeconomic class and have lower income on

an average than the main stream population. Low income can restrict their choices, especially, considering that tobacco and alcohol prices are expensive in Finland.

Unemployment was significantly associated with high prevalence of obesity among Somalis, Russians and Estonians. Not surprising the results seems to indicate that total disposable income determines dietary habits. Low income as a result of unemployment can restrict food choice, so the unemployed might end up eating poorer quality foods, such as cheaper cuts of meat with more fat and little meat. The unemployed might have no choice to consume more processed foods that are high in fat, salt, and sugar instead of more vegetables and fruits which might be expensive. McEwen et al. (2009) noticed that: rice pasta and meat were the main components of diet for Somalis in the UK while consumption of vegetables and fruits was less. Similar observation was reported among South Asian and African Caribbean groups living in the UK. For example, South Asians in lower socio-economic classes living in London were reported purchasing cooking oil, meat, and high-fat foods on a weekly basis (Penelope & Khokhar, 2008). These could be a typical food culture or a financial problem.

6.2 Relation to other studies

To some extent, the results of this study may (Sealy, 2010; Hunt et al., 2004; Kristin et al., 2008 and Cockerham, 2007) confirm the consistencies reported in previous research on migrants' health behavior. Thus health habits can be influenced by cultural values and beliefs which reflect the observed ethnic disparities in health behavior (Hunt et al. 2004). The drinking habits of Russians and Estonians (former Soviet Union countries) have been well documented. In a review, Kunst et al. (2003) identified high prevalence of alcohol use among people from former Soviet Union. The increased use of alcohol observed in this study has been recorded by other scholars to be highly significant associated with high prevalence of cardiovascular diseases among Russians (Lang 2009).

This work has found that the least acculturated Somali women and Vietnamese women are more likely to abstain from alcohol and smoking than their more acculturated counterparts. This is consistent with other researches that have used different measures of acculturation. Most studies that focus on migrants health behavior using language as a measure of acculturation, have found that alcohol use and illicit drug use rises with greater linguistic assimilation (Epstein et al., 2001; Nielsen & Ford 2000). In their conclusion, Epstein et al. (2001) stated that Latino migrants in New York City who spoke only Spanish with their family were less likely to use alcohol than their colleagues who used English as medium of communication at home. Similarly, a recent research has demonstrated a positive association between acculturation and alcohol use as well as other health risk behaviors, including cigarette smoking and illicit drug use among multi-ethnic Latino adolescents in the USA (González Wahl & Eitle, 2010).

Scholars widely agree that some cultures in African and Asia discourage and sanctions drinking among women but not men. Consistent with this research, many studies have reported significant gender differences in alcohol use among multiple ethnic groups. Without any exceptions, this work indicates that the migrant women are more likely to abstain while the men had use alcohol more frequently (Nielsen, 2000; González Wahl & Eitle, 2010).

With few exceptions, the results of this work and other scholars (Nielsen, 2000; González Wahl & Eitle, 2010) indicates that migrant women (especially least acculturated) are more likely to abstain while their more acculturated women use alcohol more frequently. The gender difference on acculturation and health behavior of migrants are evident across multiple ethnic groups (González Wahl & Eitle, 2010). Because of these differences, a number of recent studies have separated the effects of acculturation by gender. Among adults, some studies have found that alcohol use increases with acculturation regardless of gender. Other research, however, concludes that this association holds for women but not men (González Wahl & Eitle 2010; Nina, 2009; Zemore 2005).

Longer settlement time in Australia has been found to have a positive association with less smoking among Vietnamese living in Australia Brock et al. (2001). Contrarily, this result shows that longer settlement in Finland is associated with increased smoking among Vietnamese and Somalis. But the opposite is the case for Estonians and Russians.

The result of this study revealed that migrants who had lived longer in Finland are more likely to engage in physical activity. Similarly, (Brock K et al., (2001) recorded that Vietnamese who had lived longer in Australia participated more in physical activity than those who had lived for a shorter period. Not all, Nina et al. (2009) also assume that physical activity decreases immediately upon arrival in the host country for several reasons, but after an adjustment period, there is an increase in leisure time activities among many immigrant populations.

The protective effect of acculturation on obesity indicated by the result of this study is largely consistent with other studies. Lassetter et al., (2009) reported that migrants who had resided in the United States less than 1 year were obese, compared to migrants who had lived in the United States for 15 years or longer. Opposing to these results, Goel et al. (2004) documented that despite having lived in America for over decade migrants tend to gain weight. Female and male migrants initially have BMIs that are lower than their U.S.-born residents. However, within 10 years and 15 years, respectively, female and male migrants have BMIs that is almost as Americans BMIs (Antecol & Bedard, 2006).

Although education has been reported to have a positive effect on health behaviors in the general population, the results revealed the opposite. Relative to migrants (all) with few years of education, those with more years of education were more likely to have used alcohol. When revealing separately, no clear trends could be seen in the association between migrant's educational background and alcohol usage. As discussed by Cockerham (2005), alcohol use and smoking are important health behavior that can have a huge impact on health and usually indicate differences in socio-economic classes.

However he did not find any incentive to study class-health behavior association ‘As put in plain words by Cockerham (2005), ‘Soviet society was described as a classless society, without class oppression, private property, or health inequalities’. But relative to Somali migrants with lower education, those with higher educational attainment were more likely to use alcohol.

Opposing to this study, a higher educational level has been positively associated with greater participation in physical activity (van Oort et al 2006). Low education has been observed to be a determinant of smoking among adults in developed countries (Huisman, 2005). Similarly, this study found low education to have a positive association smoking. However, some of the findings of this study for the determinants of smoking were different from known determinants. Surprisingly, differences have been found for main activity and smoking. Smoking was high among working than among unemployed for all migrants. In line with these findings, some studies of the determinants of smoking behavior have shown similar results (Reine, 2004)

6.3 Validity and reliability of the study

Eligible participants for the study were identified from the national population register, who at the time of the data collection had resided legally in Finland for at least 2years. The definition of legally and regular residence in Finland leaves out those migrants who had entered the country on temporarily basis. All the immigrants born in the countries concern were first selected. A primary analysis was done to eliminate those who did not meet all the selection criteria for the study and others included. Participants were contacted via postal mail to inform them about the study.

A pre-test of the questions was done in order to minimize the problems that could arise in administering the interview and corrections were made to avoid any ambiguity and translation errors. After several revisions, the final version of the questionnaire was

produced in each of the four languages and in Finnish. There was a back-translation of all the interviews and questionnaire received in any of the four languages to Finnish. All the bilingual personnel who translated the interview were professionals. Data entry and clearance of the data were done by professionals from Statistics Finland. The researcher received only anonymous electronic data from Statistics Finland after permission has been sorted and granted.

This is the first and the largest study to examine the relationship between health behavior and obesity by length of stay, gender, education, main activity and ethnicity using a large sample that includes Vietnamese, Somali, Estonian, and Russian migrants living in Finland. In spite of the known disparities that exist in the health behavior of these ethnic groups in Finland, scholars have yet to unravel the complex associations among these factors. This analysis clarifies several important effects by comparing the relationship within and among the health behavior by length of stay of four different ethnic groups. The study also disentangled the association between health behavior and obesity of the selected migrants according to language assimilation, years of education, and main activity of the subjects.

Using smoking, alcohol use, and physical activity as measures of health behavior was motivated by the knowledge that these three habits are major risk or protective factors to important public health problems in Finland. There was no data on dietary habits which is another important factor for public health problems; therefore obesity was included in the analysis. The study mostly consisted of people of working age because socio-economic health disparities are more visible in this age.

Education, and main activity or occupational status as indicators of socio-economic position, can be associated with health behavior in different ways. People who are educated have the opportunity to acquire and comprehend healthy living habits such as reduce alcohol intake, decrease smoking and increase physical activity. People who are employed in Finland often have access to sports facilities and to occupational health

services and counseling, which can be assets in combating alcohol and tobacco use, for instance.

Education and main activity indicate socio-economic status in different ways at different stages of life. Occupational status is a useful indicator for the subjects of the study who were of working age. Choosing education and main activity as indicators of socio-economic position, is firstly because evidence on educational and occupational differences in health behavior is most readily available, and secondly because education and occupational status are best suited for comparisons of groups of different ages.

In view of the available data, it is safe to argue that this is the largest, current and quality data on migrants' health in Finland and therefore justify its use for such analysis which is primarily meant to identify the factors associated with the health behavior of the migrants.

6.4 Limitations of the study

The different data collection methods employed for this study caused some methodological constraints and bias. The use of postal questionnaires for Russians and Estonians did not allow the possibility to explain any points in the questions that the participants might have misunderstood. Not surprisingly, the missing information about some of the questions was higher among Russian and Estonian (who had postal questionnaire) than the Somalis and Vietnamese (who had interview) participants.

Misinterpretation is also likely while categorizing open-ended responses. Respondents may have answered superficially especially in this study where the questionnaire was too long to complete. Participants who were interviewed may have not been willing to answer the questions or reveal the information in the presence of an unknown interviewer and interpreter.

The analysis of the study did not consider other possible confounding factors to health behavior. Looking for the differences in health behavior of the participants by their age and the age at migration would have helped to identify the risk groups. It makes difference when one migrates as a child, adolescent or as adult. However the data was too small for search analysis.

The study did not also consider other dimensions of acculturation. A validated proxies for acculturation: Finnish language use and settlement time in Finland were used. A multidimensional scales offer a more precise measure of acculturation. While a multi-component acculturation scale was available, for example measures of ethnic identity, proportion of friends who are Finns, etc. can be used in a different study.

Probably length of stay would have been better categorized to get a clear picture of the health behavior of the newcomers and those who had stayed longer. But the number of subjects who had stayed in Finland for few years was too small that only two categories could be made. This study took place in Helsinki metropolitan area, Turku and Tampere and despite the high concentration of the selected migrants in these areas; it is unclear whether our results can be generalized to the broader migrants' adult population living in other regions of the country

6.5 Implications to the migrants and public health

The difference in the prevalence of smoking between men and women in Finland has narrowed as female smokers have increased. Because the smoking rate among Vietnamese and Somali women is low, it is important to keep these women from becoming smokers. Along with targeted intervention to assist men in smoking cessation, these nonsmoking women should be offered culturally appropriate smoking prevention education. As recorded in this study, the Somali and Vietnamese women who are more acculturated were more likely to smoke. If nothing is done now to stop this trend, the

prevalence of daily smoking among these migrants will eventually converge with that of the main stream. These will make effort to combat smoking in the main stream population be in vain.

Alcohol consumption was noted to be higher among Russian and Estonian migrants. The impact of alcohol on the health and wellbeing of these migrants was not researched. There is the possibility that there are heavy drinkers who will not be clinically diagnosed as alcohol-dependent, because excessive drinking is usually periodic, and often people who drink heavily have the perception of control over alcohol and lack of resulting problems. In addition, single high-volume alcohol consumption implies specific and important risks to health and well-being as documented (Organista, 2007). The concerns about health, safety, and social consequences of heavy drinking are highlighted in the U.S. literature (Organista, 2007). The drinking patterns of Russians especially men have been linked to serious health and social consequences including accident and injury, sexually transmitted infections, HIV, and domestic violence. The health consequences of alcohol abuse are numerous. It affects many organs in the body. To determine the health effects of heavy alcohol consumption among the migrants, researchers will benefit by monitoring cirrhosis mortality, because heavy drinking is by far the most important risk factor for that disorder.

Age standardized death rate from well-known alcohol related diseases such as chronic liver disease and cirrhosis doubled in Estonia between 1990 and 1995. These data indicate that alcohol should be a concern for public health among Estonians and Russians living in Finland. With such a huge proportion of Estonians and Russians reported using alcohol in the past 12 months and the information available about the drinking habits in migrants' home country, it is important to intervene with public health measures. This level of drinking is associated with an increased risk of many of the manifestations of alcohol related problems such as injuries which can be used to give an idea of the scale of the problem.

Furthermore, it is important to realize that the health outcomes and other determinants of wellbeing of migrants will not necessarily improve over time as migrants become more established economically and more familiar with societal norms. Therefore, taken into account such a general hypothesis that migrants will suffer both short-term dangers and long-term deterioration effects of being in Finland (different environment) - how do unhealthy health behaviors fit in?

Although the literature seems to be equivocal on the issue pertaining to the health status of migrants entering new host country, the results of this work and the literature widely support the 'healthy immigrant effect' (Singh and Miller, 2004; Fennelly, 2007). A 'healthy immigrant effect' exists where many migrants are in good health when entering a new host country due to the routine healthy lifestyle behaviors which they are accustomed to in their country of origin. For example: doing physically demanding work, walking, eating foods high in fiber and low in fat (Perez, 2002, Berrigan et al., 2006, Barnes & Almasry, 2005). However, with few exceptions, the results of this work and other indicate that the condition erodes as migrants become more acculturated (Perez, 2002, Tremblay et al., 2006). Thus some minorities from non-western societies westernize their health by adopting behaviors such as the consumption of high fatty foods, smoking, alcohol intake and a more sedentary lifestyle (Hosper et al., 2007, Wolin et al., 2006). The adoption of these lifestyle behaviors by migrants are detrimental factors for well-established mortalities such as hypertension, diabetes, cardiovascular disease, obesity and poor mental health. (Steffen et al., 2006, Guerin et al., 2007, Schulz et al., 2006).

6.6 Recommendations for further studies

Social and health policy research has paid only scant attention to the health and health behavior of migrants in Finland. Very few evaluations have been conducted to assess the impacts of migration on health and health inequalities among migrants in Finland. There seems to be limitations in policy research and the limited knowledge available about the exact dynamics and mechanisms behind migrants' health in Finland. These call for further discussions about how to intervene in migrants' well-being in Finland. There is no doubt that more effort is needed to improve research policy on migrant health, more especially as the proportion of immigrants in Finland is swelling.

Another limitation is that this study has been cross-sectional in nature. Limited or no data are available on how migration to Finland influences the health behaviors of migrant populations over time, making it difficult to infer causation. Future studies would benefit from controlled intervention trials and longitudinal designs that carefully assess the outcome of health behavior and mortalities associated with the process of migration and the effects that migration has on the outcome of health.

The most important information gaps must also be filled by appropriately targeted research on the perceptions and beliefs of migrants about their health behavior. It would be interesting to commission a qualitative research such as focus group discussions to explore the reasons behind the lifestyle choices of the migrants. There might be some cultural factors and the lack of appropriate information and other issues that can be unveiled by qualitative measures. Further, it has been pointed out that more research is also needed into the effect of acculturation on migrants' health and health behavior.

The results of this study only indicate an association between migrants' health behavior and length of stay, language proficiency, education and main activity. However the study did not establish which of these factors is an independent predictor of which health behavior for which migrant group. Further research is therefore necessary to disentangle what factor(s) predict which health behavior of which migrant group.

6.7 Conclusions and recommendations

The present study's findings suggest that smoking prevalence is very high among Vietnamese men in Finland, especially among those who are less acculturated. This finding warrants a program planning effort at the local level targeting this special population group in order to achieve a reduction in smoking. The Results emphasize the need to implement effective, culturally appropriate, language-specific tobacco control interventions among Vietnamese living in Finland. Furthermore, smokers among this group are simultaneously engaged in multiple risk behaviors that increase their risk of various chronic diseases and cancer. This subgroup might benefit from programs that focus simultaneously on smoking cessation as well as other risk behaviors.

Prevalence of alcohol use among Russians and Estonians was high and warrants intervention and prevention. Future studies must address the determinants and characteristics of alcohol use among Russians and Estonians in order to develop and provide adequate treatment services to these populations. Such studies also must consider the heterogeneity of the migrant population as well as the cultural differences within ethnic groups.

The investigations have suggested that the migration to Finland has a detrimental effect on the health behaviors of Somalis and Vietnamese women. As they assimilate to their new surroundings, explore different cultures and customs, and embrace a new way of life. In particular, there is evidence that daily smoking and alcohol use increases among Somalis and Vietnamese women who are more acculturated.

Clearly, there are particular barriers and challenges associated with the decreased physical activity levels, yet research has also recognized possible strategies for overcoming these barriers and challenges. Despite the significance of this literature, there are a number of gaps that do exist and should be considered when undertaking further research with migrant groups.

There may also be some issues associated with the measures of acculturation and assessing the behaviors of migrant groups. These groups represent a variety of nationalities and ethno-cultural groups, and as such, the meanings of the results are likely to vary. In consideration of this, a larger sample is needed for generalization of the results. Furthermore, the different data collection methods employed for this study caused some methodological constraints and bias in comparing the migrant groups.

One particular approach that needs to be highlighted is the need for cultural sensitivity on the part of the health professional in planning intervention programs. It is imperative that health programs targeted for migrant groups acknowledge cultural diversity, display a culturally sensitive attitude, and place the individual at the centre of programme development in an attempt to respond to their specific needs and deliver a programme that encourages participation and respects the culture of the participant.

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APPENDIX

Figure 1 Prevalence (%) of daily smoking among migrants by years of education.

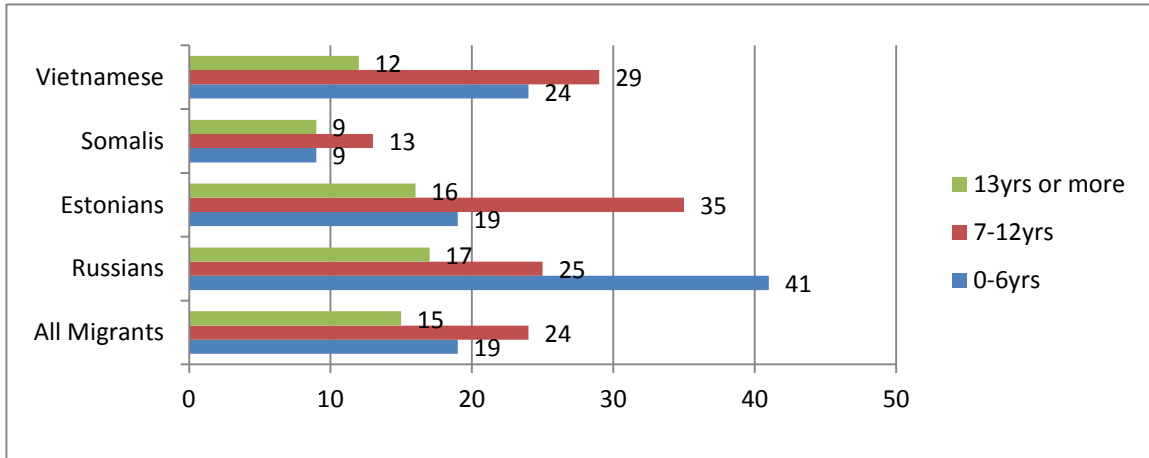


Figure 2 Prevalence (%) of alcohol use in the last 12 months among migrants by years of education

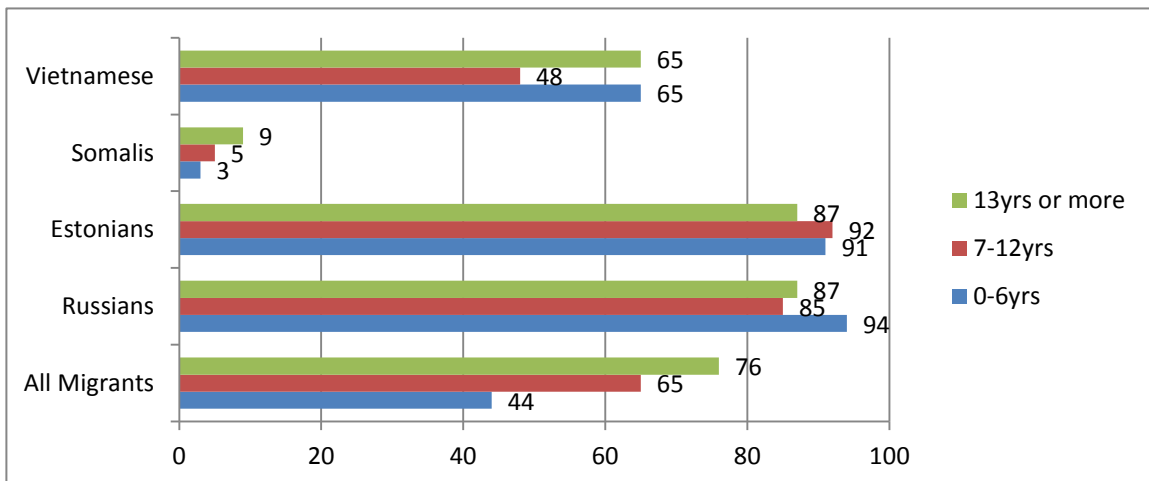


Figure 3 Prevalence (%) of insufficient regular physical activity among migrants by educational background

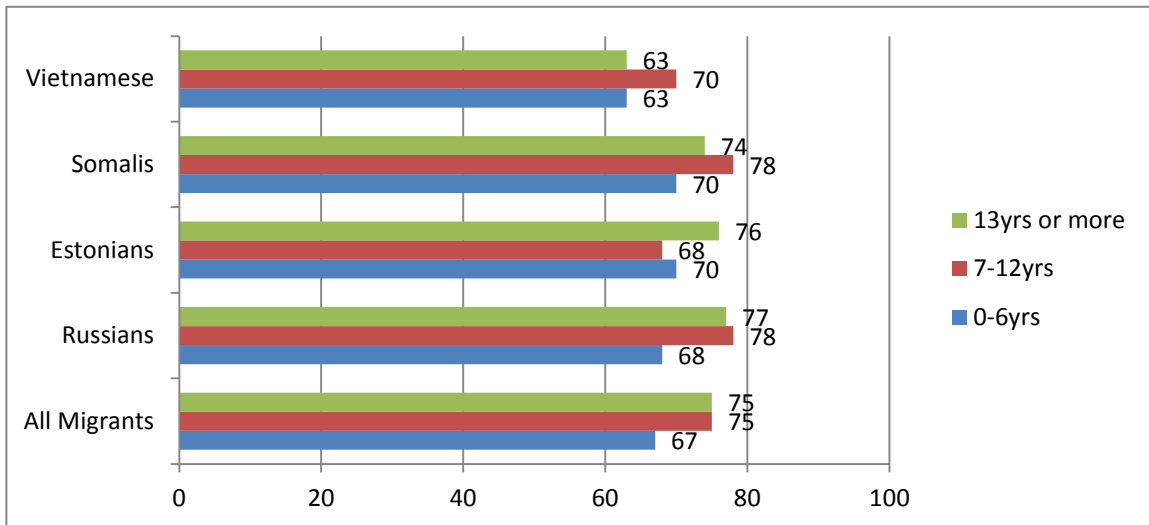


Figure 4 Prevalence (%) of obesity among migrant groups by educational background

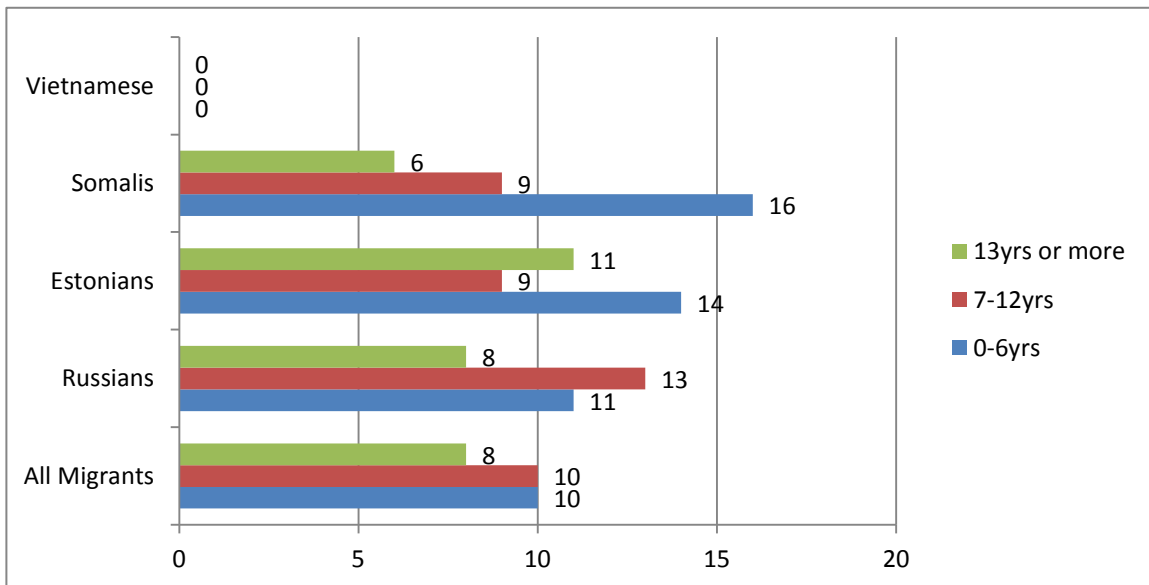


Figure 5 Prevalence (%) of daily smoking among migrants by main activity

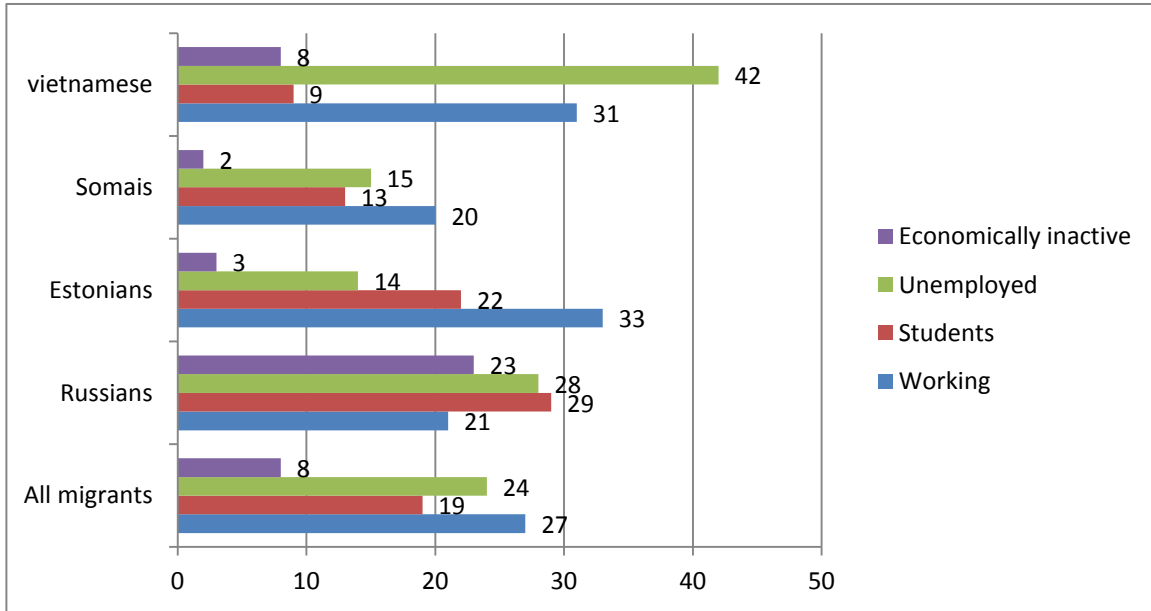


Figure 6 prevalence (%) of use of alcohol in the last 12 months among migrants by main activity

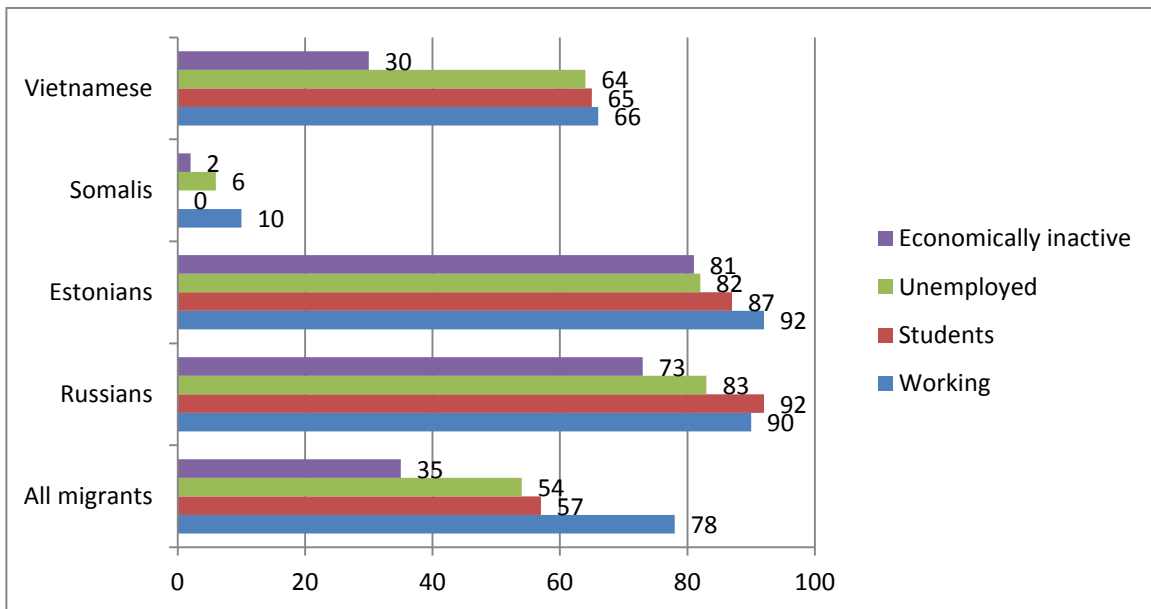


Figure 7 Prevalence (%) of insufficient physical activity among migrants by main activity

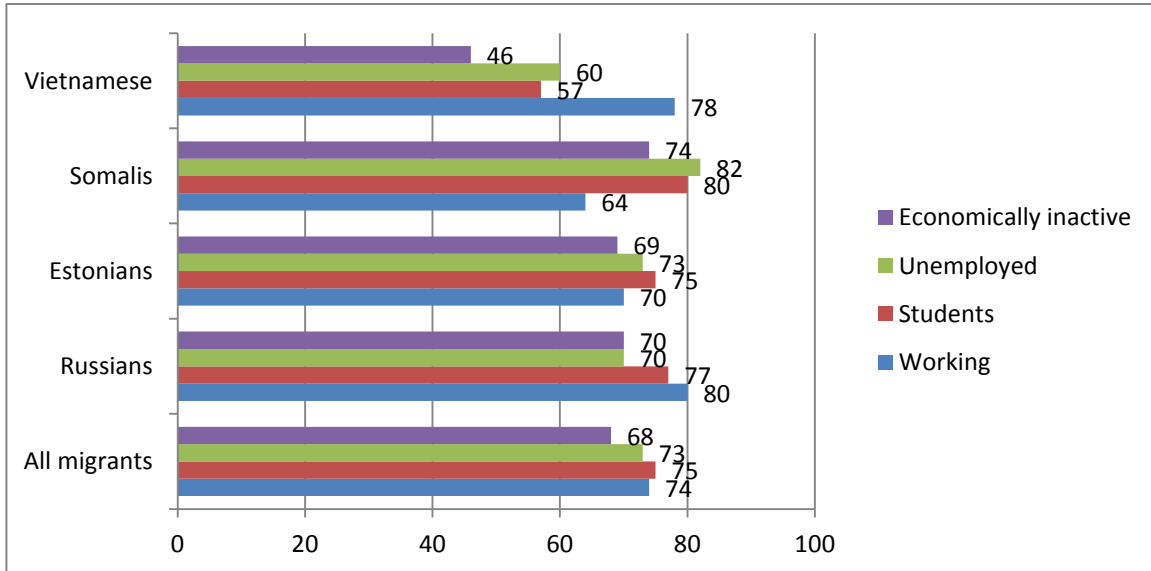


Figure 8 prevalence (%) of obesity among migrants by main activity

